Southern California's Computer Magazine
June 14, 1993 • #110
FREE

MICROTIMES

REVOLUTION & OPPORTUNITY

AN INTERVIEW WITH INDUSTRY ANALYST...

ESTHER DYSON

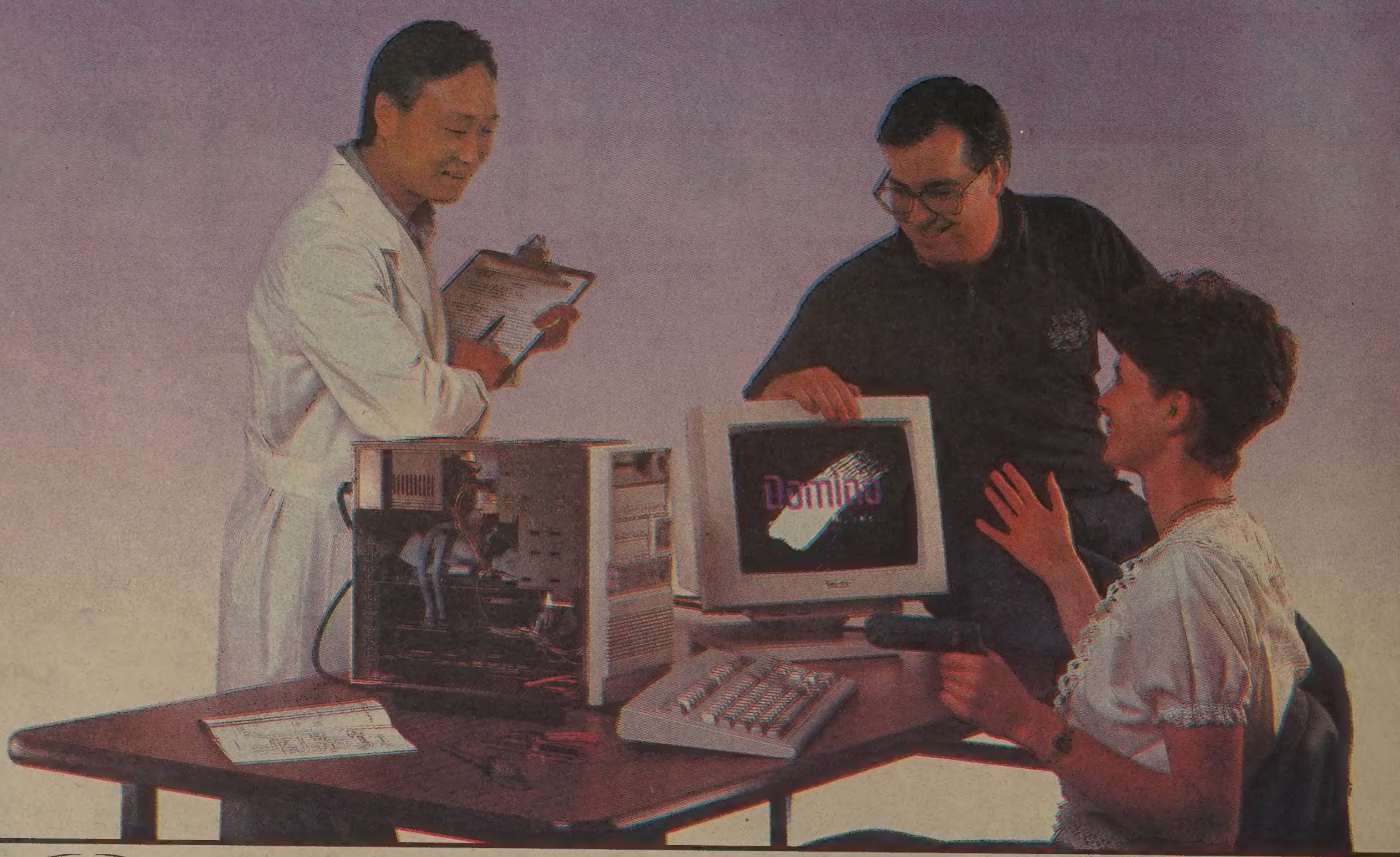
"Just as mini and mainframe people couldn't really do the PC business right, the PC guys don't know about wireless and PDAs. It is a different marketplace, and you need more alliances. You have to deal with the infrastructure and the government. There are legal issues, and intellectual property questions."

NEW SECTION INSIDE!

MultiMedia & Beyond

In This Issue: Amiga Tools; Digital World Preview; Live Multimedia; CD-ROM Authoring

You Build Your Own Computer



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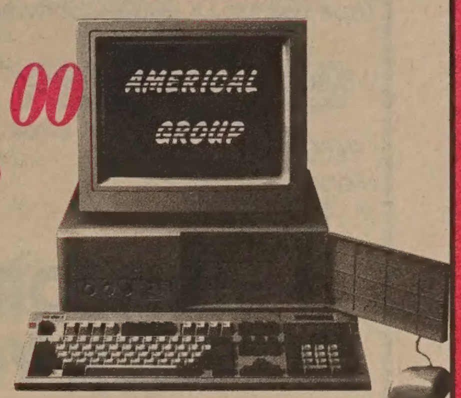

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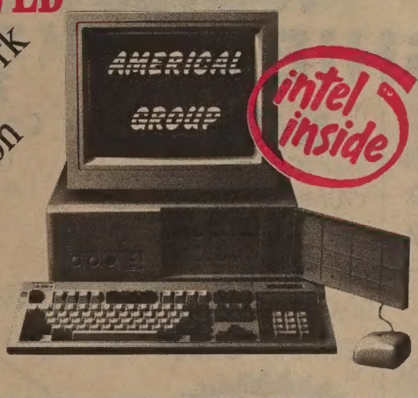

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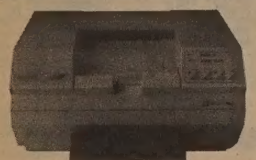

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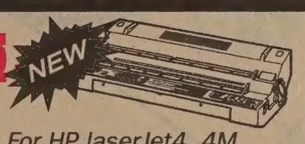

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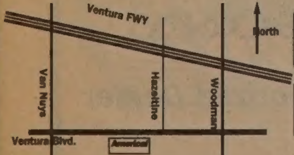

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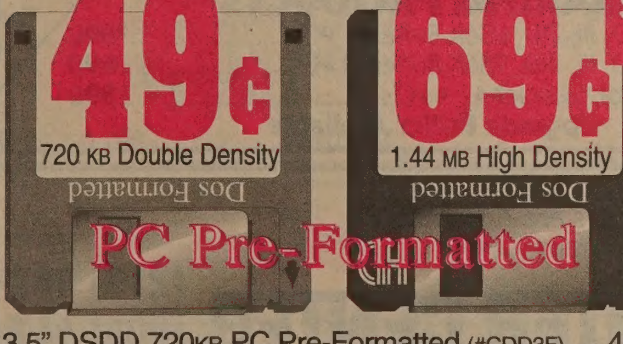

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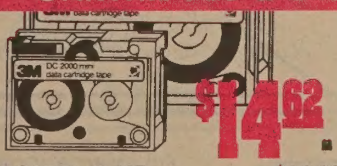
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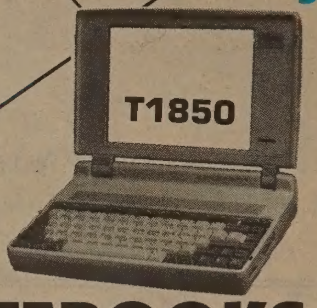

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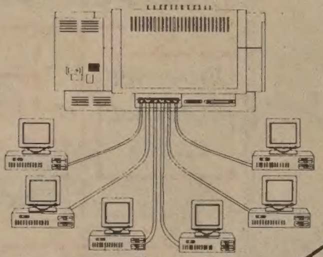

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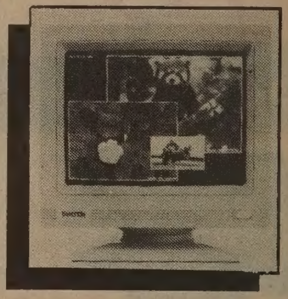

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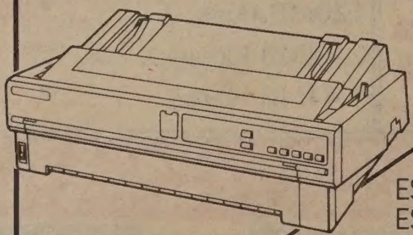

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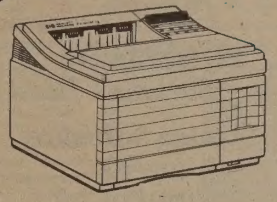

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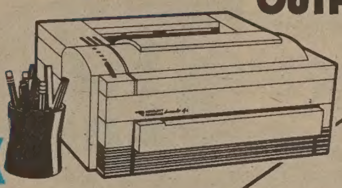

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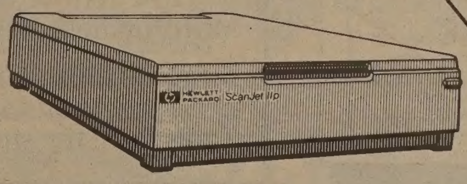

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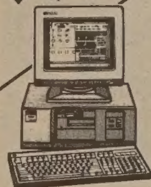

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MICROTIMES

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A NOTE FROM THE EDITORS

We're very pleased to bring you this month's cover story, a long interview with industry analyst Esther Dyson, who specializes in the interesting and non-obvious. Few people are better at forthright statements and hype dispersal, and we hope you enjoy this virtual visit.

—*ME*

COVER STORY

Revolution & Opportunity
An Interview With Esther Dyson
By Mary Eisenhart 46

Cover and contents photos: Chuck Gathard

From the PC revolution to the recent developments in Eastern Europe to such emerging technologies as wireless communications, groupware, and artificial life, Esther Dyson has been in the midst of it all, and often making it happen. Here's a look at things from her perspective these days.

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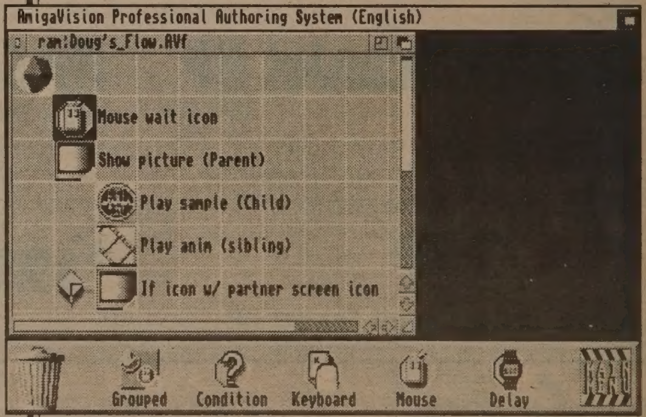
Tools from the simple to the sophisticated.



Preview: Digital World 148
Coming in June to the Beverly Hilton, this conference addresses the full spectrum of issues confronting the multimedia community.

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Live multimedia—true-life adventures.

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MX1240	1.2Gb	1"	3.5"	15ms	IDE	Call

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Samsung 100Mb IDE	249.95

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Item	Price
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DJ20 250Mb Tape Drive Internal	229
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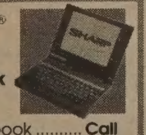

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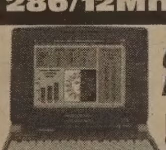

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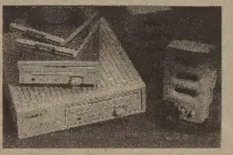

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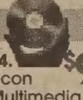

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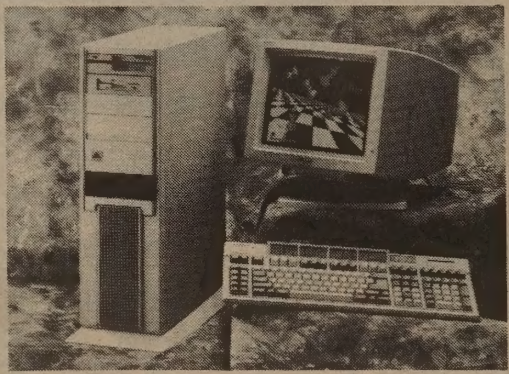

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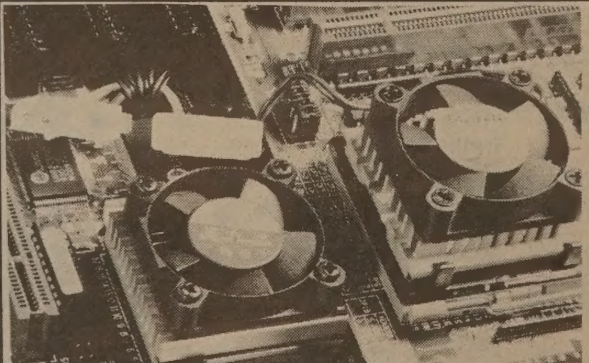

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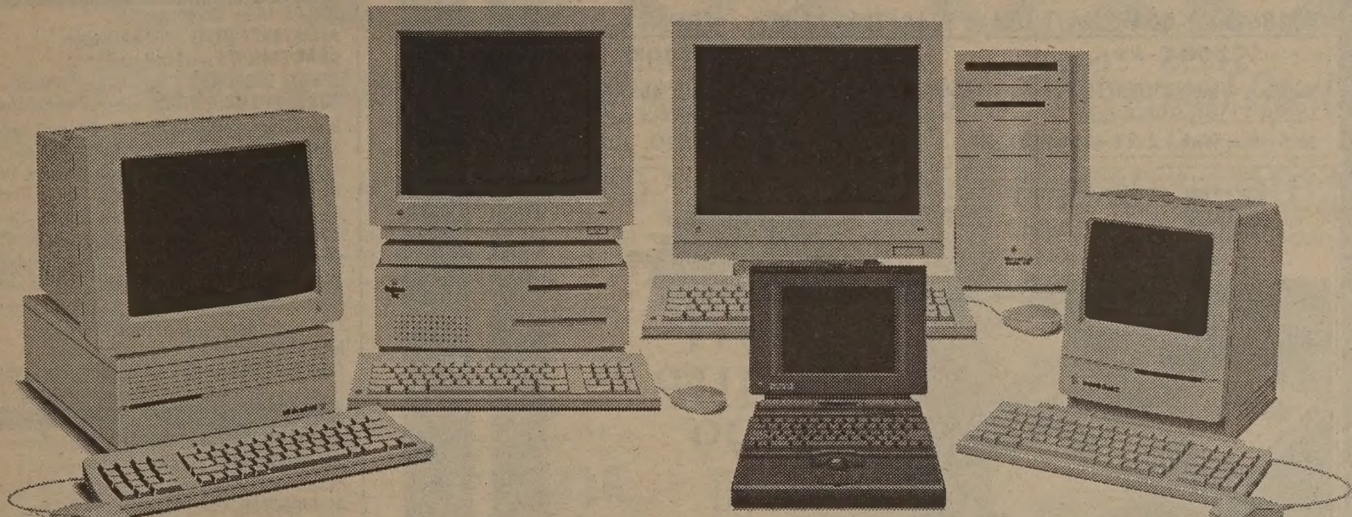

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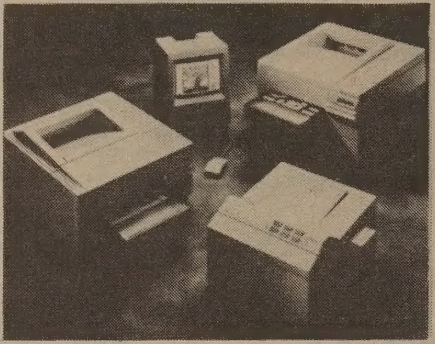

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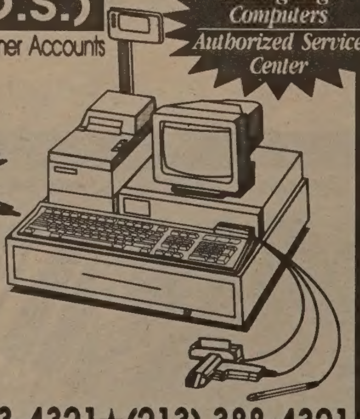

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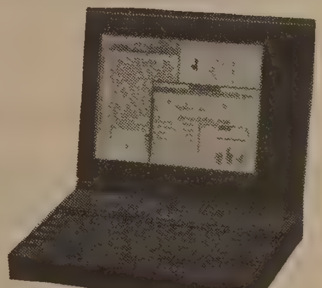

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NEWS & VIEWS

INDUSTRY INSIGHT

Move Over Pens: HP Introduces Portable Communicator With Old Interface

BY PAUL HOFFMAN

While the pentop market flounders for lack of sales, Hewlett-Packard released a new version of its keyboard-based palmtop with new communication features that will answer the desires of many portable customers. The new HP 100LX is the successor to the popular 95LX, and is much faster and more capable than its predecessor. Most important, however, is the fact that the tiny computer comes with a copy of cc:Mail Mobile built in, making it ideal for users of Lotus' cc:Mail program who want to check their mail but don't want to carry around a laptop computer.

> *Most important to computer users is the fact that HDTV in the US will be all-digital, meaning that high-quality digital images will be transmitted into the home within a few years.*

The 100LX weighs just 11 ounces and can easily fit in a jacket pocket. Although the keyboard is also tiny, the keyboard consistently got high marks in ease of use relative to other palmtops. The new model has a 9-pin RS-232 port so it can more easily be connected to modems and printers.

Copyright © 1993 by Paul Hoffman. All rights reserved. Paul Hoffman is an industry analyst who has been covering microcomputer technology for ten years. He can be reached on Internet (phoffman @well) or CompuServe (71545,346). He also writes popular microcomputer books.

The inclusion of cc:Mail Mobile makes this computer a mini-gateway to your electronic mailbox (assuming that you are using cc:Mail). As such, it can be a great boon for those who can't stomach carrying around even a 4lb. notebook just to read mail. Even if you use your portable to write simple memos or spreadsheets, the 100LX may be of great interest because it also has Lotus 1-2-3 as well as a host of small applications built in. The new model is completely MS-DOS compatible, so you can even load your own software on the system, assuming that the software doesn't take too many system resources.

The new system also has a PCMCIA slot for memory and modem cards. This is particularly useful on the 100LX because a card-sized modem can be added for not much more than the cost of a miniature modem, but adding almost no weight or size. However, PCMCIA modems do drain the 100LX's two AA batteries reasonably quickly. The new 80 x 25 screen makes it easier to run a variety of programs without having to scroll around, like you had to with the 95LX.

This barely new computer may be the harbinger for things to come on the portable scene. Instead of trying to dazzle potential customers with features like pen input or a flashy GUI, the 100LX is a solid, boring communications terminal that does not get in your way when traveling and is cheap (at $750 list, you can expect to see it for under $600 soon). While others flounder with systems that are certainly more interesting but not proven, Hewlett-Packard is doing well with established technology that gets better slowly and hits established markets with the features they want today.

DIGITAL HDTV FINALLY BREAKS THROUGH, PROMISES BETTER VIDEO FOR COMPUTERS

Instead of fighting to the end, the three primary design teams vying for the US-approved high-definition television (HDTV) joined forces late in May so that a single proposal could be approved by the FCC quickly. For many years, many different standards have been considered by the FCC for the next generation of television, and the industry has suffered from the delay. Now, the three finalists have decided to combine the best of each proposed flavor for a single standard that will bring high-quality television and digital video signals into the home in about two years.

The reason the HDTV standard has been so contested is that it will be as big of a difference as color TV was to black-and-white. HDTV offers incredibly more clarity than today's television at not much more cost (after the first few years). Given the lack of breakthroughs in television technology that have reached the consumer, there has been a pent-up demand for the better pictures that HDTV can deliver.

Most important to computer users, however, is the fact that HDTV in the US will be all-digital, meaning that high-quality digital images will be transmitted into the home within a few years. Currently, it is difficult to get good-looking TV pictures in standard PCs due to the analog nature of the signals and the difficulty of translating those signals to good digital images. With digital HDTV, however, the conversion will be so easy that it is likely that the market for TV-within-a-computer systems will grow explosively.

The merged standard means that the FCC will have to only approve (or disapprove) a single proposal. It is very likely that the Clinton White House will put the approval on the fast track, allowing the sets to be delivered starting in 1995. At the same time, television stations will start buying HDTV transmitting equipment to put next to their current analog equipment and will start simultaneous broadcasting as the first sets are sold. Under the proposal, every TV

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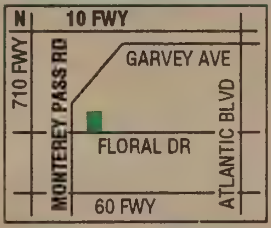

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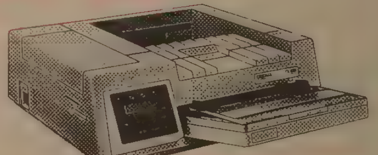
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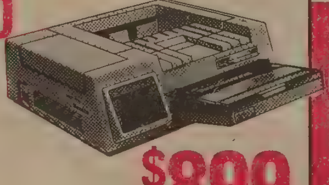
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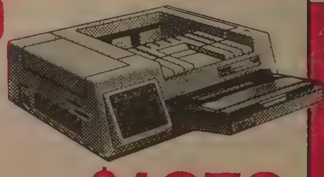
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continued from page 12

station will have to broadcast in both spectra by around the year 2000, but it is likely that most will choose to do so much sooner to avoid missing potential viewers.

In the merged proposal, stations can choose to broadcast on the HDTV spectrum at different levels of quality, allowing them to spend less money on shows for which the better quality would not pay off (such as news, rebroadcasts of old movies, and so on). Viewers may choose what to watch based on the quality of the image.

The American standard will make it more likely that home computer users will buy into HDTV, and that commercial stations will start to cater to computer users.

A common question over the past few years has been, "Why haven't the Japanese taken the lead here like they do in many other fields?" Due to strong corporate and political pressure, Japan standardized on analog HDTV, giving them quicker access to the market but much less value in the long run. The Japanese analog HDTV signal was as hard, or harder, to translate into digital computer images than current television signals.

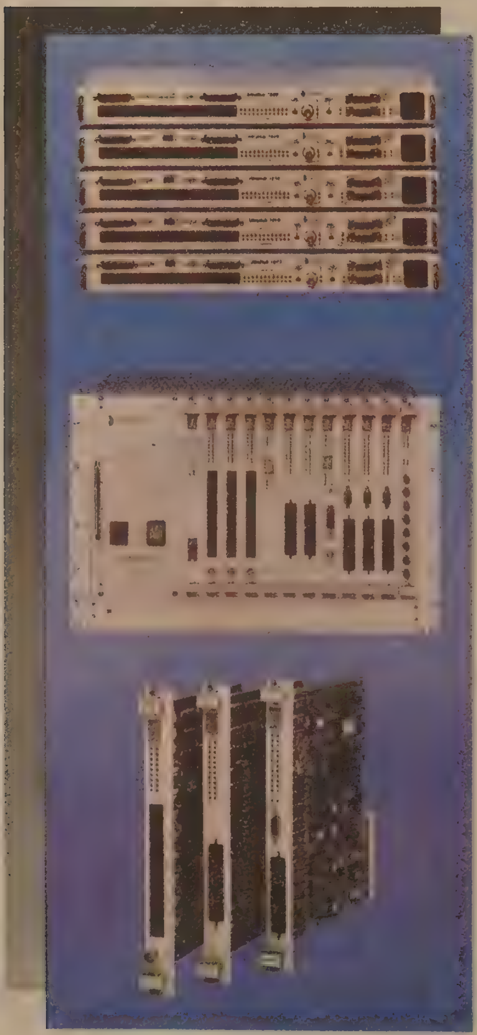
The American standard will make it more likely that home computer users will buy into HDTV, and that commercial stations will start to cater to computer users by putting special data in their pictures that computers can use to control their TV. For example, MTV could easily program in the album and artist title a few seconds before the beginning of each video, and your computer could be programmed to start your VCR when a video you hadn't seen by a long list of artists appeared. Further, TV stations could download huge amounts of text related to news shows at the same time as you are watching, allowing you to find out more about the show. Advertisers can even include product information or availability data in their ads. All of these can be easily captured by your computer, which by the end of the century may be simply an extension of your television.

WINDOWS ON MAC AND UNIX, MAC ON UNIX AND WINDOWS: PORTING COMES OF AGE

The Holy Grail of programmers is to be able to write a program for one type of computer and easily get it to run on another type. If you watch the software market, you notice that only the largest software companies have the same program running on both Windows and the Macintosh, for example. The process of getting an existing program to run on another system, called "porting," has always been a black art. As user interfaces got more complex, porting became even more so. The average software user was the loser as they found that the best programs only ran on another type of system, or a desired program wouldn't run on theirs.

Announcements in the past month should help alleviate some of the problems, at least in the Windows, Macintosh, and UNIX industries. Apple, Microsoft, and

continued on page 108



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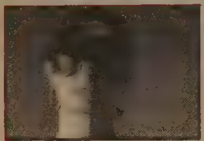

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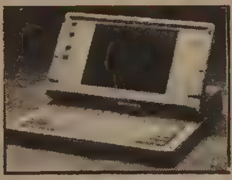

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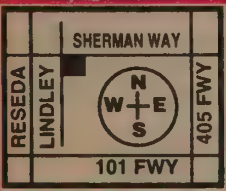

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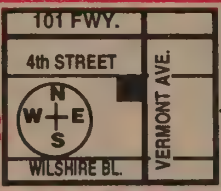

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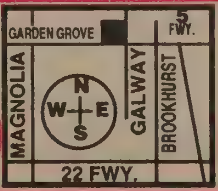

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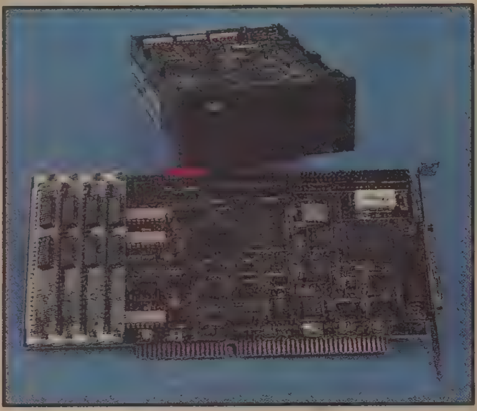

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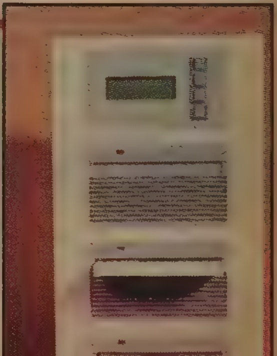

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It's Our Government; We Want In—Electronically

BY JIM WARREN

Recently, this column has concerned timely, economical electronic public access to computerized public information—particularly legislative information. In March, a bill was introduced to make already-computerized legislative records available to the public by modem, Assembly Bill 1624 (Bowen, D-Torrance)—no implementation specified.

$200 PER MONTH TO SERVE A MILLION+ CALIFORNIANS

In April, I proposed to the Assembly Rules Committee that AB1624 be implemented by making copies of legislative files freely available to the million-and-a-half or so computers connected to the Internet—the largest of the nonprofit, nonproprietary public computer networks. About seven hundred thousand to a million Californians (and ten to twenty million people worldwide) now use Internet-connected computers at work, school, or home—either directly or through its links to Compu$erve, AOL (America Online), GEnie, Delphi, Applelink, Fidonet and MajorNet BBSes, etc.

REALIZABLE FANTASIES

At the request of Committee Chairman John Burton (D-San Francisco), I drafted an implementation plan that would allow all Internet computers to anonymously copy all public legislative files. Its one-time costs are about $7000 for a file-server and Internet link, and about $200 per month—making the files available to BBSes and host computers statewide and worldwide.

Two hundred dollars a month to give perhaps a million Californians free, timely, *useful* access to the process of their governance.

With that proposal I began learning how they do the Sacramento Hustle—truly, dancing with wolves.

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CONFLICTS OF INTEREST?

The Legislative Counsel is the commercial vendor of a monopoly product. He runs the Legislative Data Center (LDC) and reaps the off-budget revenues from peddling legislative data. Last year, he charged 40¢ per kilobyte. This year, he granted himself a 25% increase. In 1992, he received $375,413 from selling public files to "clients who purchased legislative data on a regular basis." That's only about 0.7% of his $52.3-million budget. (Law book publisher Matthew Bender also paid $178,773 for most of the state codes, but that was a one-time purchase.)

The Legislative Counsel is also legal advisor to the legislators who by AB1624 might impact both his control over access and his off-budget profits.

In 1992, Legislative Counsel received $294,921 from State Net and Legi-Tech, his two largest customers. In the same year, the state's Department of General Services paid State Net and Legi-Tech $285,289.85.

The League of California Cities and California State Association of Counties (CSAC) buy online access from State Net and sell it to their members—tax-funded cities and counties. Reportedly, CSAC and the League each reap about $30,000 annual profits from those sales.

Sample fees to citizens: Legi-Tech—$175/hour; State Net—$4200 for 2880 minutes under a 24-month contract.

Legi-Tech is owned by the publisher of the politically powerful *Sacramento Bee* and *Fresno Bee*. State Net owns the *California Journal*, and their executive VP is deputy chief of staff to Governor Wilson.

Prior to May 24th, Burton and other legislators insisted that anyone receiving electronic public records and redistributing or publishing them for a fee had to contract with Legislative Counsel and (undoubtedly) pay a fee. That would include newspapers and magazines.

9.6 = 19.2 = 1544.0

How to link to the Internet? The state's central data-processing facility, Teale Data Center, is already connected to the Internet by a T-1 line, a 1.544Mbits/sec link (1544Kbits). On April 9th, the LDC director told Ms. Bowen's aide and me that LDC had a 9600-baud data line to Teale (9.6Kbits).

On April 23rd, legislator Bowen asked her attorney, Legislative Counsel, "What is [the LDC to Teale] line used for precisely?" and "What is the cost of a 9600-baud line from LDC to Teale Data Center ...?"

On May 4th, I faxed my 16-page plan—assuming the 9.6Kbit line—to Bowen for Burton, and to the LDC director and his coordinator.

On May 11th, Legislative Counsel told Bowen, only, that they had a 19.2Kbit line to Teale (an innocent 2X error). Its yearly cost is $1029.60 and is "used for sending email messages between the executive agencies and legislative offices, and for downloading data files from Teale to the LDC for use by legislative committees [for example budget data needed by the fiscal committees during budget hearings]."

On May 13th, I discovered through an outside source that LDC was installing a T-1 Internet connection. Legislative Counsel requested it in the week of May 3rd—the week before his letter to client Bowen. It was completed May 14th, including a top-o-the-line Cisco router.

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> Two hundred dollars a month to give perhaps a million Californians free, timely, *useful* access to the process of their governance.

My May 4th proposal which Bowen had adopted focused on using the Internet. Internet access was clearly Bowen's reason for asking about the LDC-Teale connection. But her Legislative Counsel never mentioned his new Internet link, able to carry 160 times more traffic than the 9.6Kbit line they first specified. When I asked, so I could correct my report, they only asked how I heard about it and suggested I ask Bowen. I did; she'd never heard of a T-1 line.

A T-1 LINE FOR LAWYERS?

The issue is open process and the public's right to know what their government is doing and planning. I explicitly requested and was explicitly refused information about what computer or uses they are planning—regardless of any report Burton had requested.

Similarly incomplete, a May 24th Assembly Office of Research (AOR) report to Burton said, "LDC indicated they are already connected to Internet for use by Legislative Counsel lawyers."

193,000 characters per second, just for their lawyers?!!

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Their legislative system includes a constituent tracking program that can pull up the (public) voter registration of a caller or writer at a keystroke. Various staff say they rarely if ever use it. One said he didn't even know about it—then said they used to go to microfiche for that information.

The May 24th AOR report proposes auditing "how many general public users accessed Legislative Information in [a] first year pilot test..."

If Legislative Counsel retains central control of individuals' access, other information about each user can easily be added to the voter registration data.

The AOR report also states that Legislative Counsel wants to "establish reasonable checks and balances to avoid the possibility of a user downloading the entire data file for resale." So much for citizens, libraries, or universities indexing or cross-referencing complete legislative files.

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THE HORSE'S MOUTH

This writer often speaks on technology, government, freedom and privacy, and also about personal computing's history and futures. On June 18th, he will be the banquet speaker for the Ohio Libertarian State Convention. He will speak at the Association of Area Business Publications' national convention in San Francisco at the Fairmont on June 28th, and at the BBScon '93 convention in Colorado Springs, August 25–29 (303/693-5253). ■

Warren founded InfoWorld, *Wireless Digital, Initiative, Inc., and one of the nation's largest public microcomputer conventions. He was founding host of PBS's* Computer Chronicles, *founding editor of* Dr. Dobb's Journal, *and has chaired various trade and professionals' organizations. He holds graduate degrees in computing (Stanford), medical information science (UC Medical Center), and mathematics & statistics. He has been a computer professional since 1968 and was a mathematics teacher and professor for ten years before that.*

He organized and chaired the landmark First Conference on Computers, Freedom & Privacy (1991) and received one of the first Electronic Frontier Foundation Pioneer Awards (1992). He is a member of the board of directors of Autodesk, Inc., and also chairs the Communications Committee of the California Public Records Act Reform Coalition.

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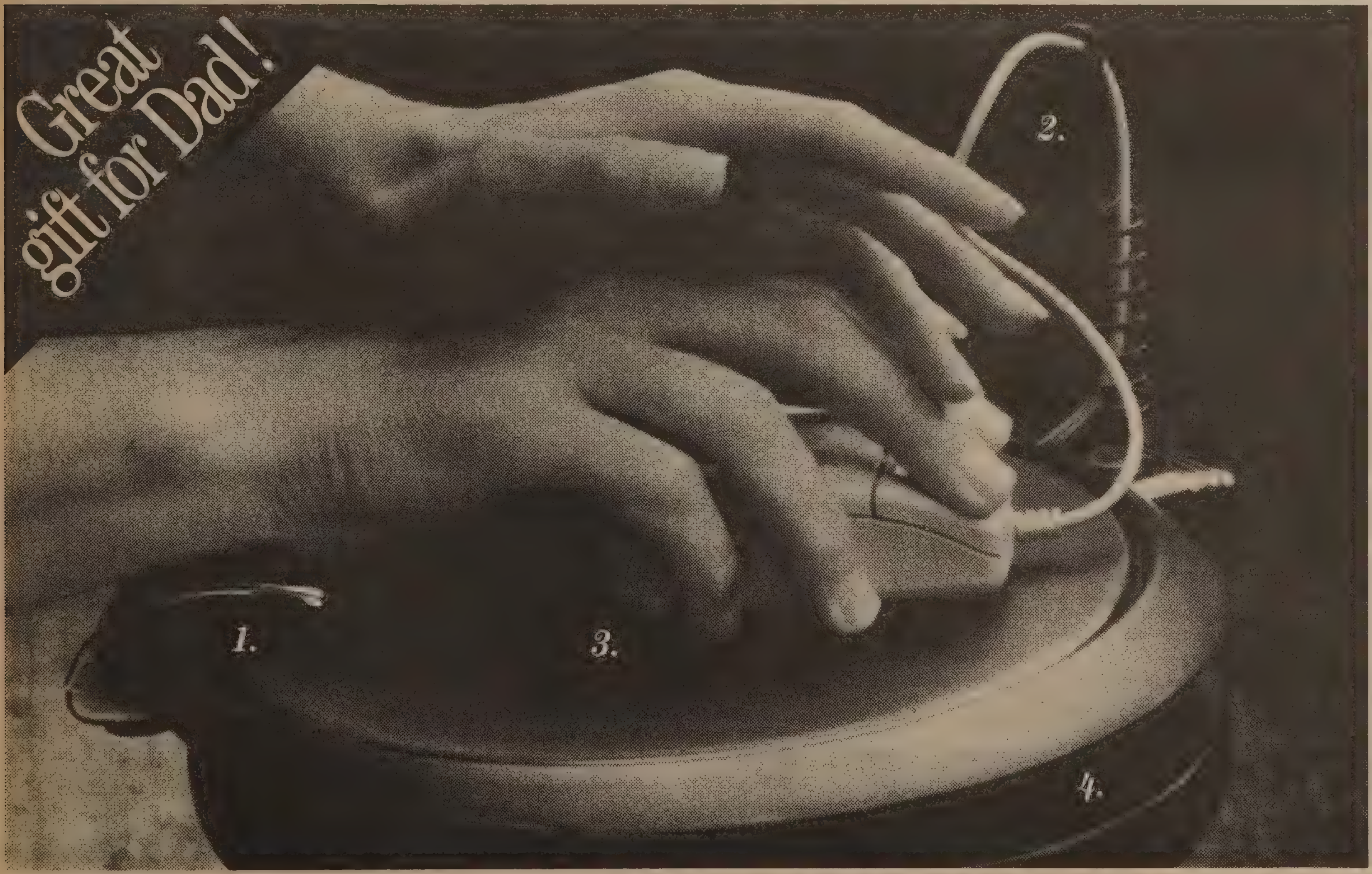

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HP 100LX: The Palmtop With Everything?

BY MITSU HADEISHI

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The HP 100LX is Hewlett-Packard's new version of its ever-popular DOS palmtop, the HP 95LX. Selling for a street price of around $750, it represents excellent price/performance. By keeping the exact same size and shape (also known as "form factor") as the original 95LX, the 100LX represents a great increase in functionality and usability without a corresponding increase in size or weight.

In particular, the new machine sports an LCD display that shows a full 25 lines by 80 characters of text and CGA resolution graphics. The built-in applications have all been totally reworked, making them much more user-friendly and powerful than those in the 95LX. The machine still comes with all of the usual personal information manager applications (address book, world time, memo pad, etc.), and Lotus 1-2-3 v2.2 as well (complete with graphing), and they have all been considerably improved.

From the outside, the machine looks almost exactly like the 95LX, which brings me to a rather strange part of the story. In the process of procuring a machine for this review, I initially received one that did not function properly. As it happened, though the inside of the case read "100LX," the boot-up display read "Welcome to the HP 95LX." The screen had a small crack in it, and several keys did not function. After a little further investigation, it turned out that the external case appeared to be a 95LX case, despite the gold "100LX" lettering on the inside cover. Very odd. Needless to say, I returned that machine and got another one for this review.

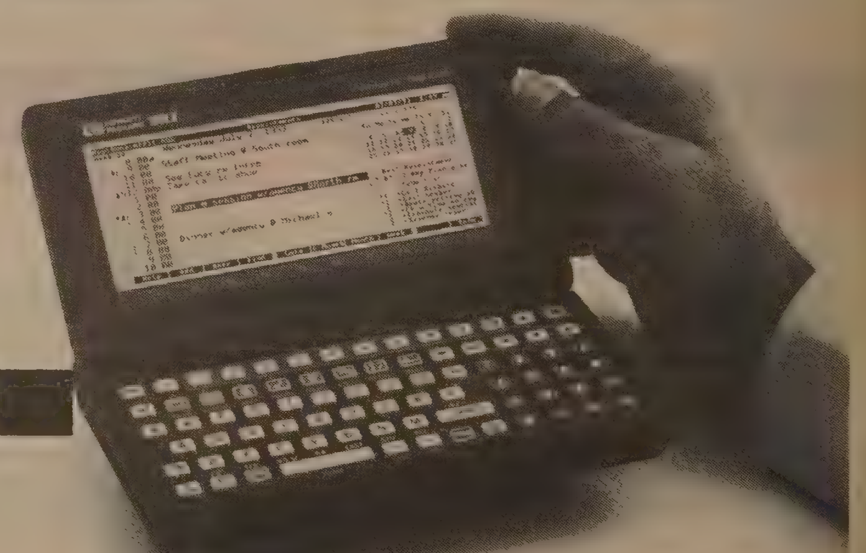
PENS AND PALMTOPS

Will The Real 100LX Please Stand Up?

Happily, when I received my working 100LX, it seemed quite sturdy and up to HP's usual standards of quality.

The most impressive thing about the unit has to be its display. Though exactly the same size as the original 95LX LCD display, this one can show you a full screen of DOS text. Larger fonts can be used as well (and are often used by many of the built-in applications), since in the full-size 25 x 80 mode the machine uses a very small (though still quite readable) font. However, this display is very sharp, high-contrast, and readable from almost any angle. The text font is quite pleasant to look at (far nicer looking than the font used in the older 95LX, for example).

The base unit comes with 1MB of RAM, which makes it much more powerful and functional than the 512K 95LX. One megabyte of RAM allows you to run quite a number of the built-in productivity applications at the same time, while leaving enough extra space for a 352K RAM disk (you can increase the size of the RAM disk, but you cannot decrease it). The keyboard is very much the same as the 95LX—just about large enough to be able to type quickly, but not big enough for most people to touch-type. With enough practice it is quite possible to get up a pretty good typing speed on this machine.



Even with a megabyte of RAM, the largest amount of RAM I could manage to configure for the DOS session was about 375K. The SETUP program allows you to configure DOS with up to 512K of free RAM, however. So presumably with a RAM expansion card you could run DOS programs that require up to 512K. A PCMCIA 2.0 slot is provided, letting you plug in the most recent PCMCIA expansion cards, including fax modems, SCSI interfaces, Ethernet cards, and so forth, TOLL FREE **1-800-974-9901**

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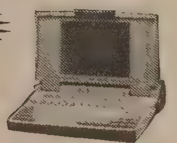

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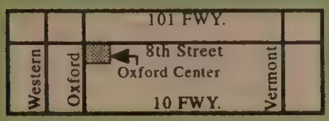

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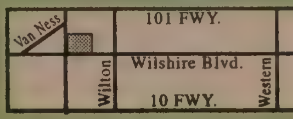

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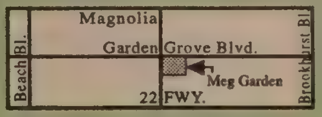

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Contact: Steve Hoechster,
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which should be compatible with the 100LX since it also has a full-screen display, and therefore can run any ROM-based DOS software contained in these cards. With a SCSI card, for example, you could attach a SCSI hard disk to the machine, at least in theory; or with an Ethernet card, plug your 100LX into your LAN.

The user interface to this machine has been considerably improved, with a Windows-like menuing system which is consistent among all applications (except for Lotus 1-2-3). Just a press of the MENU key, and a menu bar appears. The menu bars are complete with a Help menu, placed just as in Windows applications. Though the help feature is not very context-sensitive, it is possible to use the machine without opening the manual, since most of the functions are explained quite well in the online help. Dialog boxes, pop-up windows, and other graphical features enhance the style and appearance of the unit, giving it a much more professional look than the 95LX, which tended to use plain text-mode for its user interface. The World Time function on this new unit comes with a map which shows you the locations of many cities around the world, for example.

The built-in applications include a calendar/scheduler, an address book, memo pad, HP calculator (complete with graphing, financial, and solving capability), world time, Lotus 1-2-3, cc:Mail, a note taker, a database program, a stopwatch, a terminal program, a file manager, an application manager, and a DOS prompt (from which you can run DOS applications). The applications manager allows you to run programs from either an iconic interface or a text interface.

One minor annoyance with this machine is that when you run an application, it typically stays in memory when you switch to another app. Thus, if you keep switching from function to function without quitting your other applications, you will fill up memory with quiescent programs. Therefore, it is generally a good idea to "quit" an application before changing functions. It would have been nice if you could set up some of the applications to automatically save and quit when you switch to another, to avoid having to press three keys to switch applications (MENU, Q for quit, then the other application key). However, the machine will allow you to run a DOS prompt even if there are other apps running, as long as there is enough memory to do so. This is convenient if you have a simple utility or something you'd like to run without having to exit all your other applications to do it.

One megabyte of RAM allows you to run several of the built-in productivity applications at the same time, while leaving enough extra space for a 352K RAM disk.

The 100LX is evidently designed not only as a personal information manager, but also as a personal communicator. The cc:Mail application allows you to send and receive electronic mail from cc:Mail hosts, which simplifies the process of handling your email. You can compose email off-line, connect briefly and retrieve your email, then read it at your leisure. The telecommunications terminal program provides standard terminal emulation capabilities, including X, Y, and ZMODEM file transfer protocols at speeds up to the full serial port capability of 115,200 bits per second.

This machine, like the 95LX, was designed primarily as a computational and note-taking device. Though the graphical user interface is much improved, the memo pad still does not support multiple fonts, though it does support

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boldface and underline styles. So you aren't going to use the 100LX as a word processor, but it works fine as a note-taking device and text editor.

The database and address/phone book features are very powerful and flexible, and after a little bit of investigation, quite easy to use. You can search the databases for text appearing in any single field or anywhere in any field, either case sensitive or insensitive. The database is fully configurable, allowing you to add or change field names and sizes of where they appear on the data-entry form. After just a few minutes of playing with the database program, I was able to change field names, move them around on the form, and so forth. The database program comes with a sample "restaurant database" file, to give you a flavor of what is possible with the flat-file database. The other built-in applications are similarly well designed, and generally easier to use and more convenient than their 95LX counterparts.

> ***Though at $750 it remains one of the more expensive palmtops, the power and flexibility of having a full 25 x 80 screen in a pocket-sized device has made the 100LX a very popular machine already.***

Lotus 1-2-3, of course, remains one of the more powerful aspects of the 100LX. The primary improvement here has to do with the larger screen size (you can toggle between two font sizes). You can see much more of a spreadsheet on the 100LX than on any other palm-sized computer I've used before.

Overall, this is a very impressive update to an already very popular machine. Though at $750 it remains one of the more expensive palmtops, the power and flexibility of having a full 25 x 80 screen in a pocket-sized device has made the 100LX a very popular machine already; I had a very difficult time getting a hold of one for this review. HP claims that by the time this review is published it should be relatively easy to get one. Of course, the market situation may change drastically with the advent of the Apple Newton, which should be hitting the shelves soon (see below). However, at present, HP is currently selling one of the more powerful and well-designed palmtops on the market today.

Pen News And Rumors

•Apple is currently saying that it's planning to ship the Newton this summer. Rumor has it, however, that the machine is going to be very close to the $1000 price point (rather than the "well under $1000" they were quoted as aiming for last year). More on this developing story in next month's column.

•AST Research is releasing the PenExec "PenTop," a pen-based computer built on the technology of the GRiD Convertible which I reviewed in this space a few months ago. As you may recall, the Convertible is a hybrid pen computer which includes a laptop-style full-sized keyboard. The machine weighs 5.5lbs and comes in an 11.6" x 9.4" x 1.6" case, much the same size and shape as a traditional notebook computer. The target price is "under $3000."

AST's specific contribution to this machine includes an extended life battery (providing up to three hours of continuous operation), PCMCIA support, 200MB hard drives, and RAM expansion to 20MB. AST will also be providing support and service for the machine; because of its existing reseller and distribution channels, it will be able to send the Convertible and accessories out to a much larger number of sites than GRiD was able to do on its own.

•In a related announcement, Slate Corporation will be publishing AST Pen Essentials, a package of pen software applications and accessories tailored for the AST PenExec. The application set includes LooseLeaf Notetaker, Delrina WinFax Pen, Day-Timer Pen Scheduler, and PenBook Business Reference Pages. A demo version of this package will be shipped with every AST PenExec computer.

•EO, Inc. has announced that it is now shipping the EO Personal Communicator 440 in volume. The EO Personal Communicator 440 is based on the AT&T Hobbit low-power RISC processor, and it includes networking and email software. The operating system is GO Corporation's PenPoint. No price was available at press time.

•IBM has announced its second-generation pen-based tablet computer, the IBM ThinkPad 710T. The 710T features either a Type III and a Type II PCMCIA slot, or three Type II PCMCIA slots. A 60MB hard drive which can fill one Type II PCMCIA slot is an option, and comes preloaded with either PenPoint or PenDOS. The machines use the IBM 486SLC/25 MHz processors. Battery life is projected at 3.3–4.1 hours. Price is $2999 for the 5.5lb. unit without hard drive, and $3599 or $3699 for the 5.8lb. 60MB hard disk version, preloaded with either PenDOS or PenPoint, respectively. Set-up, service, and usage assistance are available from IBM during the warranty period through the IBM Personal Systems Help Center .■

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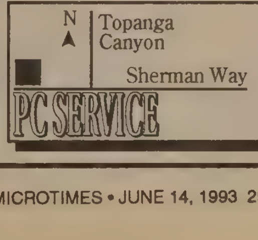

A Spreadsheet for the Home User

Lotus Offers A New Version Of 1-2-3 Tailored For The Home User.

BY ED KAHN

RESOURCES:

Lotus 1-2-3 for Home, $149
Lotus Development Corp.
55 Cambridge Pkwy.
Cambridge, MA 02142
(617)577-8500

As more and more applications become available, they are increasingly directed to specialized and sophisticated users. Yet, one of the fastest growing segments of the computer business is the home market. Laptops have come down in price to the point that many people who did not have the space to devote to a full computer system are buying the lightweight models and outfitting them with applications that can be easily mastered.

The most popular application is a word processor. There are literally hundreds of them on the market. The next most popular application is the spreadsheet. While there are a less complex spreadsheets available, many users feel the need to use Lotus 1-2-3 largely because it is the name they are most familiar with. When they open the package, they often discover that they have bought a bulldozer when all they needed was a shovel. Thousands of pages of documentation and the capability to run a huge business is simply more than they bargained for.

Lotus recently introduced a new version tailored specifically to the home user: Lotus 1-2-3 for Home. This is essentially the standard product, scaled down a little and appended with fifty financially oriented spreadsheets they feel will be of interest to the home user. The basic 1-2-3 spreadsheet is release 2.3, an excellent version of the product without too many bells and whistles. Unlike the full scale release, this one is limited to 256 columns by 512 rows. This is certainly more than enough room for most home applications. Many businesses can get along with this size spreadsheet as well.

Not only is the scope of this home model scaled down to something manageable, but the price has likewise shrunk. While the regular release carries a list price of something close to $500, this release has an affordable list price of $149.

Those new to computers often do not know which is the best application for a particular job. For instance, you could make an address list on a word processor. But this is not the best tool to use for the job. A spreadsheet with database capability like 1-2-3 would be a better choice because it lets you sort the names alphabetically as you make additions to your list.

While spreadsheets can also be used for jobs best suited to a word processor, they really shine when you are doing jobs that require number crunching. Take, for example, the person who has a few pieces of rental property. It would be possible to type a document that listed each property in rows down the left side of the page and in columns across the sheet indicate rents, mortgage payments, taxes, insurance, and the like for each property. Then you could total all of the columns and rows up so you would know how much rent you took in for all of the combined properties, as well as your total payments for mortgages, taxes, and insurance. As you totaled across each row, you would know the net income for each property. When one of these figures changed, you would have to recalculate the effected row and column manually. With a spreadsheet, on the other hand, your printed document would look the same, but recalculation would consist of nothing more than changing the one figure that needed to be altered. The number crunching would be done by the spreadsheet automatically once you had set it up the first time.

> ***While spreadsheets can also be used for jobs best suited to a word processor, they really shine when you are doing jobs that require number crunching.***

Likewise, you could do many jobs with a word processor, spreadsheet, or database manager. Lotus has included fifty SmartSheet templates. While some of them may actually be useful, I feel that a lot of them are there merely to pad the number of templates included. Some of them actually take advantage of the particular strengths of a spreadsheet, but others utilize the layout properties of a spreadsheet, but make no use of number crunching. For instance, a household inventory could just as easily be done on a word processor. A daily scheduler, broken down hour by hour, is actually more easily obtained from the stationary store.

Other included forms, however, are best suited to 1-2-3. A mortgage amortization template allows you to calculate monthly payments and amortization on a loan. A mortgage refinancing template lets you analyze the pros and cons of refinancing an existing mortgage. A perpetual inventory control template is useful for a small business that wants to keep track of inventory, sales and purchase orders for replacement inventory.

While many of these templates will never be used by most people, they are nevertheless useful in that they illustrate the kinds of things that a spreadsheet can do. A spreadsheet is a really valuable and powerful tool. This product is the real thing and easy enough to use so the novice can get both a good introduction to the tool and also work with the industry standard. The files created on this release of 1-2-3 are, of course, compatible with other releases of the program.

Lotus has chosen to include a very simple user's guide with this product. It is a wonderful way to get started. If you run into trouble, there is extensive on-screen help available by hitting the F1 key. If you still

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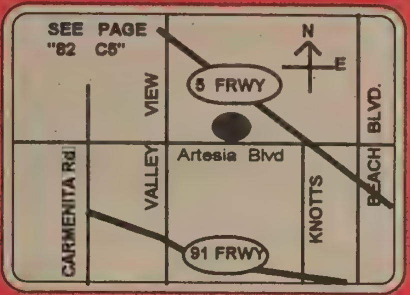

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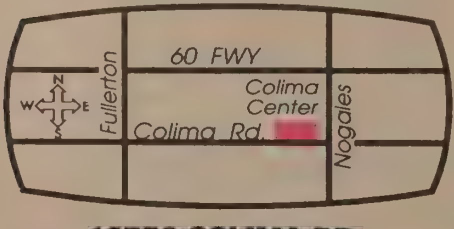

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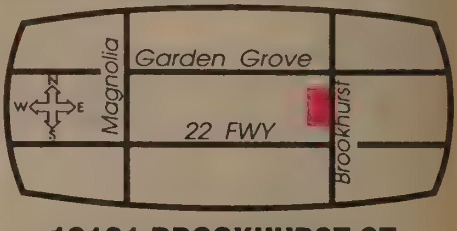

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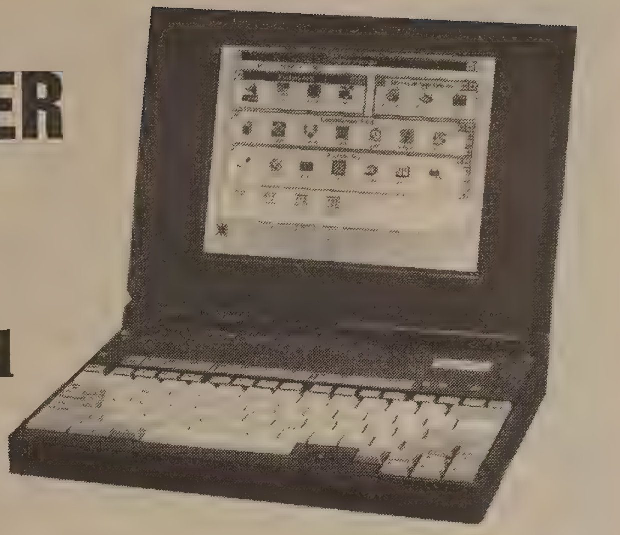
need more help, you can call Lotus' 24 hour toll-free product support number. While I appreciate Lotus' attempt to keep things simple, I wish they had also included a more extensive *User's Guide* similar to what comes with the full grown product. I had to call them several times to figure out details that an experienced 1-2-3 user would probably know, but that are not explained anywhere in the provided documentation.

If you have wanted a spreadsheet, but balked at the high price of Lotus 1-2-3, this may be the package for you. While it is a DOS program, it is set up so it can be run as a DOS program from within Windows. Mouse support is also provided. Installation is a breeze, with clear instructions on the inside cover of the user's guide.

COMPUTER OF THE MONTH:

Packard Bell 486DX25 Notebook



Packard Bell, while a well-known name in computers, occupies a nearly unique position in that it specializes in products that are turn-key models available through mass merchandisers. Their current offering is just as you might expect: completely ready to go. All you have to do is turn it on; all of the software is loaded. When you turn on the computer, it opens to the Program Manager for Windows 3.1.

The Packard Bell 486DX25 is quite impressive, powered by a 25MHz, 486DX processor. It comes standard with 4MB of RAM, which is expandable to either 8 or 20MB. It also has a double density 3.5" floppy drive and a 120MB hard drive. The notebook weighs 6.8lbs. and measures 8.5" x 11" x 1.7."

This computer opens up to reveal a 9.5" black on white LCD display that supports VGA resolution. If you want a color display, it is easy to connect a VGA monitor of your

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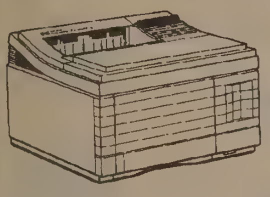

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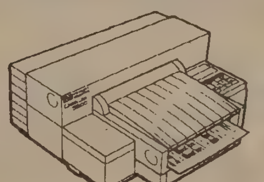

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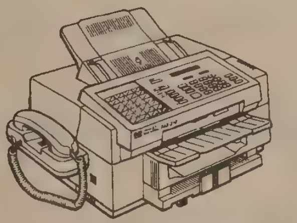

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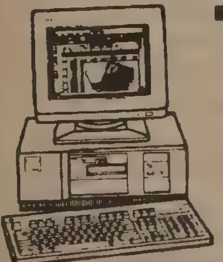

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choice to the port on the back of the unit.

The keyboard gets the job done, but is not as nice as some of the other portables that I have reviewed in these pages. My complaint is pretty standard. A Function key is required to invoke PgUp, PgDn, Home, and End. For a typist this is inconvenient. The rest of the keyboard layout is fine. Fortunately, you are able to connect a keyboard of your choice through the port on the back.

Packard Bell has designed the ports on the back to so that you can attach both the included mouse and a keyboard. Some less well-designed machines make you choose which you want as they provide only one port.

When I asked Packard Bell for a list of accessories, they replied that they had included everything with the unit. It seems like they have. A 2400 baud modem is included that also serves as a 9600 baud send-only fax. Software for sending faxes is, of course, included. I understand the need to cut costs, but am a bit disappointed with the send-only fax as I find receiving faxes nearly as important as sending them. To get around this limitation, I suppose you would have to use a standalone fax/modem attached through the serial port.

> *Packard Bell's current offering is just as you might expect: completely ready to go.*
>
> *All you have to do is turn it on.*

The battery pack included is Nickel Metal Hydride. It will run for at least two and a half hours with no power management features invoked. If you conserve power through the use of power management you may get as much as four hours of use between recharges.

The software that comes loaded on the machine includes enough to really get you on your way. MS-DOS 5.0 is the operating system. Windows 3.1 lets you navigate through your programs. Finally, Packard Bell has bundled a variety of applications from Lotus. Lotus Write for Windows is provided for the word processor. While this is not quite as feature-filled as Ami Pro, it is certainly adequate. 1-2-3 for Windows for Packard Bell is provided for a spreadsheet. This, likewise, is adequate for most users. WinFax lets you send faxes.

Packard Bell has produced a good notebook computer. In addition to the hardware and software, there is a one year warranty and excellent product support. They offer 24 hour a day live technical support as well as support through CompuServe, Prodigy, and their own bulletin board system. ■

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New Communication And Information Technologies Help Keep Teleworkers In Closer Touch With The Home Office.

BY ROBERT MOSKOWITZ

Telecommuting is a straightforward way to cut back on the costly time, energy, pollution, and space requirements normally associated with people getting to a job and performing useful work. It accomplishes this by moving the work, not the worker. Although telecommuting sounds like it might be complicated and many people associate it with high technology, if you've been reading these articles you probably recognize that technology is not the central issue in telecommuting. Far more important are issues of workers having the right mix of personal styles, managerial support, task responsibilities, and motivation. For thousands of successful telecommuters, the only technology they need is a pad and pencil.

Although technology is not essential to successful telecommuting, computers are installed in more than 50% of the households where people telecommute to work.

But sometimes good technology helps make telecommuting a darn sight easier and more efficient. For example, computer programmers and data entry workers both benefit from today's advanced computer networks that allow them to operate from a terminal anywhere in the world with virtually the same speed and efficiency as if they were working down the hall from the main computer room. Advanced devices help move information faster and keep teleworkers in closer touch with the home office.

In recent years, communications technology has been improving at such a rapid clip that millions of employees who formerly had no hope of working successfully from home, or for that matter from anywhere outside the central office, are now good candidates for cost-effective telecommuting from any location that's convenient for them. So let's spend a few minutes looking at modern communications technology, and how it can be deployed in support of telecommuters.

ADVANCED PHONE SERVICES

After the pencil and paper, teleworkers' next most-often used technology is the telephone. Just making a call to the office or to a customer or client increases any employee's power to function effectively from a distance. But the basic telephone is now being enhanced with additional features that make telecommuting easier and less of a hindrance to successful job performance.

ISDN. Originally proposed more than a decade ago as a worldwide standard, ISDN is only now becoming readily available in the United States. ISDN stands for Integrated Services Digital Network, and the key operative word is "digital." It brings a marked increase in information-carrying capacity and flexibility to existing telephone installations. ISDN is ideal for a telecommuter who wants to transfer a large volume of information to or from home or elsewhere without making the usually required investment in new wiring.

ISDN can be used with fiber optics, coaxial, or just about any type of cabling system. But it makes particularly good sense when used with the twisted-pair wiring that makes up the overwhelming bulk of our already installed telephone system. ISDN—which requires ISDN-compatible telephone equipment—turns these prosaic wires into a virtual highway of information, providing simultaneous channels for any combination of computers, faxes, and voice conversations. By making two or more ISDN telephone calls to the same place, at a moment's notice you can quickly and easily add more information-carrying capacity, as needed, including the power to carry real-time video signals.

Call Forwarding and 700 Numbers. Call Forwarding programs one phone to call another automatically, so people dialing the first phone are smoothly connected to the second phone—even at another location—without any action on their part. The new 700 numbers are a smoother, faster technology to do much the same thing. Once assigned a 700 number, a teleworker can quickly and easily make all the calls dialed to that number ring on—or "terminate" on—virtually any other telephone in the world, and can change where the calls terminate at a moment's notice. For people working in an office, Call Forwarding is mildly useful because it's

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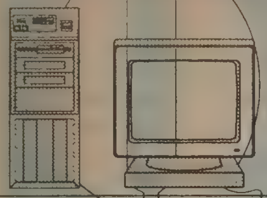

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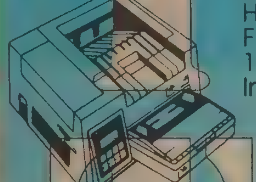

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Because Service Doesn't Stop at the Cash Register relatively easy for a colleague, customer, or supplier to call the main number and have the call switched anywhere the intended recipient is sitting. But when someone works from two or more locations at different times and days, some of the people trying to make contact may not know where to call at the moment, or may be forbidden by company policy from knowing the telecommuter is working from home.

Used properly, Call Forwarding and 700 numbers can automatically route all incoming calls to the proper person, wherever he or she may be working at the moment. This technology gives teleworkers a great deal of freedom they otherwise would not have. They can move from office to office during the day, work in different locations on different days of the week, and switch their schedules around at a moment's notice to meet a host of demands. All the while, they remain readily accessible to others because they can be reached at a single telephone number.

Call Waiting. Call Waiting uses just one telephone line, but simulates the features of a multi-line business system. While you're on the line, a short tone signals another incoming call, and the caller hears a steady ringing. A few pushes on the touch-tone keypad allow one to switch back-and-forth between the first call and the second. With this service you can continue to make telephone calls or spend as much time on the phone with one customer or client as you need, even when you are expecting someone else to call you. Call waiting allows a teleworker to operate more efficiently than is possible with just a single line and costs far less than adding a second one.

Conference Calling. This is the flip side of Call Waiting, which allows you to receive two calls at the same time. Conference Calling allows you to make two calls, and to put the two calls together to make a conference call. Again, this service simulates a multi-line business telephone system, and allows the telecommuter to get more done with the single telephone line usually found at home or in a small office.

Speed Dialing. This is software or hardware that dials a preset sequence of numbers at the push of a 2- or 3-digit number on the telephone. Speed Dialing is a big help during a long day of working away from the office because staying in touch often requires repeated dialing of area codes and numbers, with extensions—a tedious chore that is prone to errors. Whether rented from the telephone company or purchased built-in to a special telephone, Speed Dialing tends to enhance productivity for anyone who uses the telephone to do business.

Cordless Telephones. These are relatively inexpensive telephones that use a two-way radio link between a cordless handset and its base-station somewhere in the home or office. The only wire is between the base station and the telephone jack in the wall. Cordless telephones come in one-line and two-line versions, and permit the teleworker to wander or work anywhere inside or outside the home or office, while still being "near the phone." On one occasion, I brought the cordless phone up on my roof as I swept off some leaves and found myself handling a business call while sitting fifteen feet in the air.

Cellular phones. With telephones so vital to teleworkers, it's only natural that a true cordless telephone—one that works not only in and around the home, but nearly anywhere in North America—would become a popular tool with teleworkers. Although cellular phones are more expensive than wired phones (the cost is comparable to calling coast-to-coast all the time), they're a great convenience for people who need a phone at times when they aren't likely to be near one. Teleworkers who operate from home or a satellite office usually don't need cellular services. But people who work on construction sites or other remote areas, or who spend a good deal of the day moving from one location to another often consider them essential.

FACSIMILE

Facsimile (fax) is one of the most important new technologies to emerge in the last decade or so. As you almost certainly know, fax machines allow you to put a piece of paper in here, and have an exact image of it come out, almost instantaneously, over there—anywhere, in fact, that has a fax machine and can be reached by telephone. Fax machines are very easy to operate, require almost no training to operate, and are far less expensive than the messengers and express mail they replace. Teleworkers—and others—can use the fax to send and receive documents very rapidly and cost-effectively.

In the late 1980s and early 1990s, tens of millions of fax machines were installed worldwide, all 100% compatible with each other and all a simple telephone call away. Nearly a million American teleworkers have fax machines installed at home. This well-established infrastructure makes it easy, fast, and economical to fax drafts of memos and reports, hand-written telephone messages, contracts for negotiation, photos, drawings and artwork, and dozens of other types of information between the teleworker, the main office, and other locations—such as the offices of clients, customers, or suppliers. By faxing a document and then calling to talk about it, the extra distance to the teleworker is totally erased.

Cellular faxes are portable versions of the standard fax, and make sense for teleworkers who need to send and receive faxes when they aren't likely to find a plugged-in fax machine available nearby.

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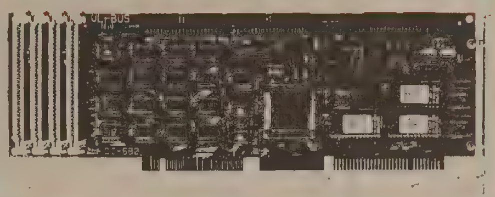

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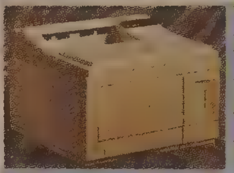

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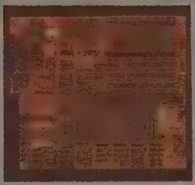

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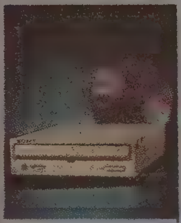

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VOICE MAIL

Voice mail is essentially an electronic form of the secretary who takes telephone messages and passes them on to the intended recipient. But it has the added advantage of capturing the caller's entire message, including the inflection and tone of voice. There are essentially two types of voice mail services:

Messaging. This is the recording function of the voice mail system. It captures the caller's voice and replays it—often only to the intended recipient, who punches in a special identifying code—whenever and wherever desired.

Forwarding. This gives voice mail extra power to enhance productivity. Once you retrieve a voice message, you can add your own comments and send the whole package back to the original caller (provided he or she has a telephone on the same voice mail system) or to anyone else on the system. This saves a lot of time and paperwork, and tends to make teleworkers's desk seem as close as the nearest telephone.

PERSONAL PAGING

With modern satellite technology, a teleworker can carry a personal pager, or "beeper," that will work anywhere in North America. Some of the more elaborate ones will not only sound a tone, but will display a telephone number or another message. Some systems will record the caller's voice message, then trigger the pager signal, and play back the message when the paged person calls in for it.

Regardless of how much or how little information it delivers, though, a personal pager provides a special link between the home office, customers or clients, and the teleworker. It allows anyone who knows the right phone number to make a high priority contact with the teleworker, anywhere he or she happens to be. For the teleworker, it provides a higher level of confidence that he or she can be reached without having to sit at a desk or stay within earshot of a telephone.

COMPUTER SERVICES

Although technology is not essential to successful telecommuting, computers are installed in more than 50% of the households where people telecommute to work. Many have modems that allow communications with computers at the home office. This allows telecommuters to connect with office networks, tap into computerized databases, exchange electronic mail with people elsewhere in the company, and generally remain well-connected to the office to which they would normally commute.

Electronic Mail. This term refers to a general computer capability to exchange short messages, data files, and whole computerized documents with other computer users. Email, as it is popularly called, most often works primarily between people in a single company or division. But commercially available email networks make it possible for a teleworker to exchange information with millions of

continued on page 61

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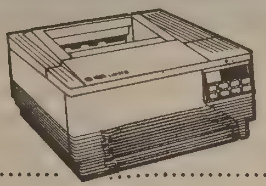

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- 101 Keyboard
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- * 245MB Connor IDE Hard Drive 12ms
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- * VESA Local Bus SVGA Graphics accelerator card w/1MB. Resolution up to 1280x1024. 72Hz refresh rate. 16.7 mil. colors.
- * 14" VESA standard NON-INTERLACED Super VGA color Monitor. 72Hz at 1024x768. .28 dot pitch. Maximum res. 1280x1024.
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- * 4MB RAM installed (Exp. to 32MB)
- * Middle Tower case w/200W UL power supply
- * 1.2MB & 1.44MB TEAC Floppy Drives
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- * IDE Floppy/Hard Drive Controller card
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- * 101-Key Keyboard
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- * Hi-Resolution Mouse

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* 17" Viewsonic 7 Monitor	$660
* VESA LB IDE Cache ctrl. w/2mb	$245
* 340MB 12ms IDE Hard Drive	$ 80
* Ultrastor 24F EISA SCSI ctrl.	$260
* Adaptec 1742AK EISA SCSI	$395

VESA LB System Upgrades

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* Orchid P9000 w/2MB VRAM	$265
* Orchid Superboard VLB w/256K	$100
* 15" Color Flat Screen Monitor	$120
* 17" Viewsonic 7 Monitor	$660
* VESA Local Bus IDE Controller	$ 45
* VESA LB IDE Cache ctrl. w/2mb	$245
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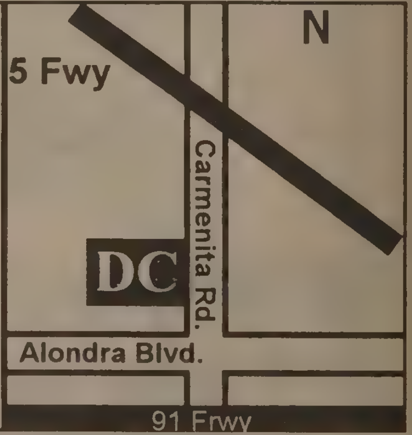

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- 101-Key Keyboard
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- IDE FD/HD Controller card
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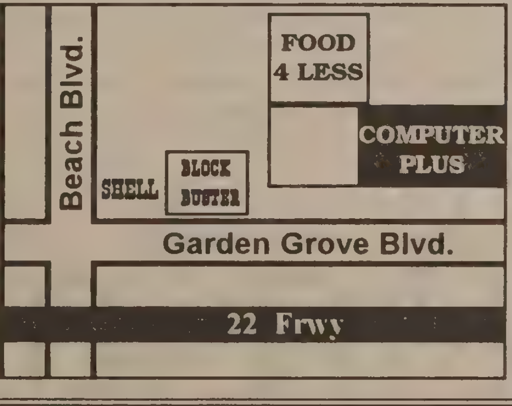

REVOLUTION & OPPORTUNITY

By Mary Eisenhart

As we go to press with this story, Esther Dyson is in Ljubljana, Slovenia, working on the arrangements for this year's East/West High Tech Forum, which will once again bring together entrepreneurs and programmers from the erstwhile Eastern Bloc and their more established counterparts in the West. This, some would have it, is an exercise in quixotic futility, but Dyson has never been one to follow the conventional wisdom, though she's frequently had a hand in shaping it.

"Esther," says longtime friend Mitch Kapor, who invited her to serve on the Electronic Frontier Foundation's board of directors, "is always interested in

An Interview W

the new, the offbeat, the leading edge, just because it's interesting. So from very early on, she's done the best industry analyst coverage of emerging technologies, from groupware to AI to you name it. That's her specialty. And finding those people who are going to be the key movers and shakers. The PC industry renews itself, and sort of cross-pollinates with itself, when we bring together all the people at one of her conferences.

"Esther is not a promoter. She doesn't, as I see it, ride these hobbyhorses and say this thing is going to be great, it's going to change the universe. She asks more questions, sometimes, than she has answers.

"I don't look to Esther to provide lucid technology evaluations. She spots the right people. Then I go talk to them myself. She points in the right direction. She identifies the circumference where interesting things are happening. "

Often called "the most powerful woman in the computer industry," Esther Dyson is the proprietor of EDventure Holdings Inc. (212/758-3434), a small New York-based company that produces two newsletters, *Release 1.0*, aimed at the US computer industry, and *Rel-EAST*, which covers emerging technology markets in the former Soviet bloc, as well as two annual conferences, PC Forum and the East/West High Tech Forum. In addition to serving on EFF's board, she's a limited partner in Mayfield Software Partners, an affiliate of the Mayfield Fund, a leading venture capital firm, and a trustee of the Santa Fe Institute, a New Mexico thinktank devoted to complex systems, what some would call Fringe Science. But she eludes definition in these terms as readily as she eludes definition as the daughter of noted physicist Freeman Dyson.

"Esther," says EFF co-founder John Barlow, "is very much a creature of the present. She's just fast-moving. She's very *light.*"

At PC Forum, she tells the departing attendees, "The purpose of the conference is to change minds. If you don't walk out of here with any new ideas, we haven't done our job." And, while the pricey and star-studded Forum bears some resemblance to other industry gatherings, there's a deliberate deviation from the boilerplate.

There's not a suit in sight, and the casual observer would have a hard time telling the industry honchos from the hopeful garage guys. Nor would it particularly occur to the unsuspecting visitor that the short-haired, barefoot figure hanging out in the halls talking to people is in charge. On panels, any executive unwary enough to sound like his marketing department gets "That's very nice, but what does it *mean?*" from Dyson.

This year's conference sessions ranged from the pragmatic to the visionary; instead of yet another lecture on Windows NT's path to world domination, the assembled executives, VCs, entrepreneurs, analysts and marketroids got Congressman Edward Markey holding forth on "A Vision For The Electronic Frontier," and, in an almost riotously well-received lunchtime address, Santa Fe Institute's biologist Tom Ray's discussion of genetic algorithms and his artificial-life "critters."

"These are people," says Barlow, "who are not going to run across that stuff anyplace else. And they may not know very much about bit-flipping—I think that Tom was probably making some false assumptions about the technical expertise of that audience—but when somebody starts talking about growing your own software for complex environments, I would say that every ear in that room was listening."

Not, of course, that every presentation is so successful. Barlow recalls, "I remember a speech here a couple of years ago from a guy that really had some very important ideas, but didn't have a good way of presenting them, and it was *appalling.* There were actually people throwing dinner rolls at him. It was so bad it was terrific.

"That was a risk she took that didn't quite make it, but she takes those risks, and I think they are a valuable service in enriching the overall ecology of the business."

Says Daphne Kis, director of the Forum and one of EDventure's small intrepid staff, "It's Esther's whole goal to not espouse the party line, but to get people to say something to push the edges, to redefine the boundaries in some way.

"There's no definitive agenda because it all fits together, because it's all motivated by what she's interested in. She's not beholden to anyone other than her interests. It's a very unique position. If there's something she decides she's interested in, she makes herself an expert in a very short period of time."

"She found out that I was going down to the CIA the other day," says Barlow, "and immediately wanted on that bus just to see what the inside of the CIA looked like. She didn't have some direct functional reason for doing that: she went a ways out of her way to do it. But she saw the opportunity and jumped on it."

And so, when we met for this interview at the Computers, Freedom & Privacy conference, we started with the obvious question…

What was the CIA like?

Well, I found it depressing. My reaction to it was simply that yes, these were people that wanted to change, but they didn't get it. Just like IBM. Just like Gorbachev. There's this sort of intellectual understanding that we ought to change, but there's none of that thing, somewhere between emotional and intellectual, where you get it. They don't really. Some of them surely do, but to me a good intelligence service is smarter than everybody around. They don't just have more information, they're better at analyzing it.

It's like the feeling I had when I was in college and I decided I needed to go see a shrink.

I went, and he didn't ask me tough enough questions, so I just lied to him. Not because I really wanted to lie, but because he wasn't smart enough to get to the point. So that was it. I said, forget it. Whatever problems I've got, I know more than this guy does.

I had the same frustrating feeling about the CIA.

In Russia, I go out and I talk to *folks.* You get the sense that IBM, the US government, the CIA, they all talk to senior political officials. The senior political officials in Russia were completely out of touch with reality too. The guys who ran the coup were drunk out of their minds the whole time. They had no idea what popular opinion was, they didn't have the sense to turn off Relcom [a net

ith Esther Dyson

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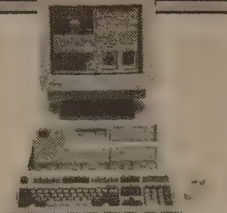

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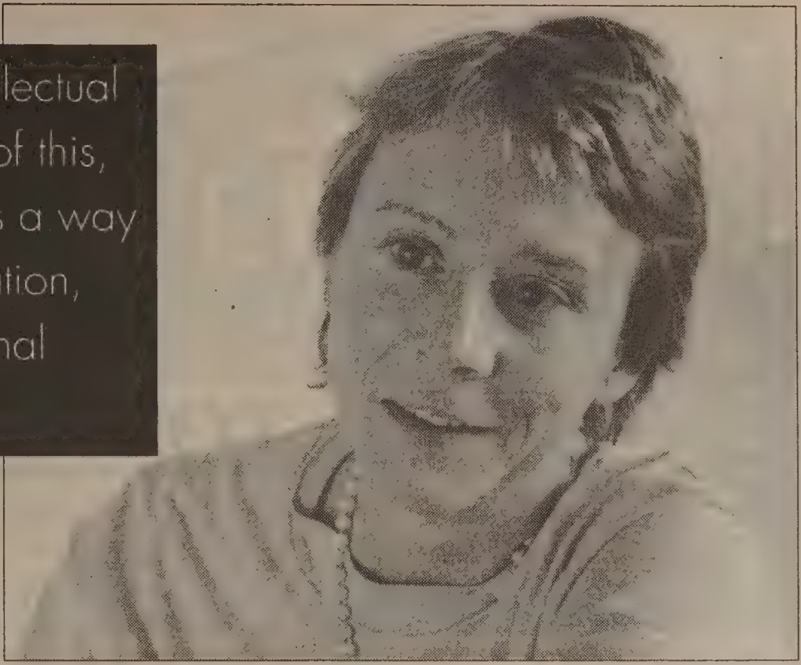
"I'm much more right-wing on things like intellectual property, and letting markets manage more of this, and laws and regulations less. I think there is a way to have a market in a lot of personal information, as long as you give ownership of that personal information to the individuals."



node that disseminated regular bulletins to the outside world]...

I'm glad we're doing it, and I was very interested to go meet some people from the CIA, but I'm not as optimistic as the others.

On the other hand, if the CIA wants to come out and be on the nets, God bless 'em, and we'll help them if we can. Except that's not EFF's primary mission. To my mind our mission is to help foster the creation of communities. Not just the existing net community, but other communities that might come onto the net, even if they never become part of the "net" community.

In the end, a community should be focused around something, not around its own existence. It needs some identity that's bigger than itself. Not larger, but more than just being its own collection. It needs some distinction between itself and the rest of the world, whatever that might be. Just like a living thing.

Yeah, and it contains in itself that it is this,and it is also not that.

Right.

You can't separate the not-that. People go through great religious problems about that.

Yeah, each community has an immune system, therefore. That's fine, as long as you defend your community rather than attack other communities.

How did you come to get involved with EFF at all?

Well, I've known Mitch for a long time. He's one of the people that has good values, and he started getting interested in this kind of thing.

I thought what EFF was doing was neat, and I talked to him a bit, but I'm still very much out in the commercial world. So when he asked me to join the board, the first thing I said was, "Well, you know, I don't really agree with you on everything." And he said, "Well, that's just the point."

At which point I said, "Well, great, wonderful..."

What didn't you agree with him on?

Actually, less than I thought. But my job is not to be part of the net community. With EFF, it's to allow it to exist and help define rules for it.

I'm much more right-wing on things like intellectual property, and letting markets manage more of this, and laws and regulations less. I think there is a way to have a market in a lot of personal information, as long as you give ownership of that personal information to the individuals.

But I don't spend all my time on the network. I see myself more as an ambassador from this community to the commercial world that needs to know about it. I'm more of an observer, so I'm not really a member of it.

I'm not really a member of the commercial community, but it's probably more my community than this one.

What community do you consider yourself a member of?

Really, none, in any serious way.

Same thing in Russia—I don't go around pretending to be Russian.

But you speak Russian.

I speak Russian and I understand it better than most people, but I'm not in it. I'm much more of a catalyst everywhere.

The other reason I joined EFF was I knew I wanted to learn more about this stuff, and I wanted to get more involved and more informed, because I didn't really know what my opinions were, or what EFF's opinions were, or anything. Clearly the best way to do that is to jump right in and force yourself to learn.

I expected to learn a lot about the Internet and all the stuff. The other unexpected pleasure is that what I *am* part of is the board of EFF. The first time you go to any of these meetings you feel like an outsider, but now I feel part of this group. Not a homogeneous group, but...

That's been fun, because in what I do, I mostly observe. I argue with people, but I don't get in there and help make decisions. I'm not *engagee.* So that's been really nice.

So how did you get into this line of work, varied as it is?

Well, I originally was a reporter for *Forbes* for three years. I had no knowledge of business. I started as a checker, where somebody would write a story and I'd go check their facts.

This was right out of college?

Well, I did two years of the moral equivalent of dishwashing. I worked for a public interest group for a year, and realized I didn't think what these people were doing was in the public interest. My first real publication was "Help Wanted: Employment of Women and Minorities in Retailing." Which I thought was a great title.

We took Sears, Montgomery Ward's, K Mart, which at the time was Kresge, W.T. Grant, which has since gone bankrupt, and J.C. Penney. We got their EOC filings, and we analyzed those with a little calculator, and I talked to the companies about their policies and practices.

W.T. Grant had a terrible record. They were going bankrupt, and they couldn't afford to train people; they couldn't afford to do any of this stuff. Sears, who really had the best record, was also being sued, almost precisely because they had hired enough women and minorities that some of them got together and started agitating for more.

The companies were basically trying. It's a difficult problem—you need two sides of an argument, but I felt that this group was way too far over on one side. I certainly believed in hiring and promoting women and minorities, but I also felt these companies were genuinely trying to do their best. I mean, I'm sure there was some store manager who was a total jerk, but in the total scheme of things I thought they were trying. Maybe this kind of pressure made them do better, so whatever.

I learned an awful lot. It was the first time I'd seen an annual report of a company. But it wasn't what I wanted to do with the rest of my life.

Then I went to *Forbes*, and about the third story I checked was about a crooked mortgage banking company. Sort of by reverse engineering I learned how to understand an annual financial report, and a whole lot of stuff about accounting. And I did a few things on computer companies...

What time period was this?

This was '74 to '77. I decided I wanted to go to Japan and write about the

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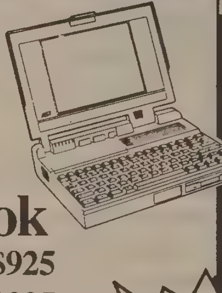

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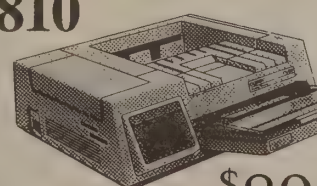

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Japanese computer industry. *Forbes* wouldn't pay for me to go, because I was pretty junior. so I said, "Look, I'll pay my own way, I'll take vacation time, but can I at least say I'm a *Forbes* reporter and set up interviews?" They'd have been crazy to say no, so they said yes.

I went to Taiwan, Hong Kong, and Japan for three weeks. I paid my own way. I was making, I think, $10,000 a year, and the whole trip probably cost two or three thousand.

But it was totally worth it. It was simply wonderful. I had a ball, and I wrote a story for *Forbes* about the Japanese hardware threat and sort of said "Hardware is a threat, software is not." At the time, that was kind of interesting.

But I got tired of writing *stories*. I wanted to do something where my judgment was required, and I also didn't really have the kind of nasty cynicism that *Forbes* really liked and rewarded. So I went in to quit, and the editor said "Well, that's good, because you're a smart kid but you're just not cut out to be a *Forbes* reporter."

So I went onto Wall Street, to New Court Securities, which took Federal Express, Cray Research, and Tandem public. This gave me my early imprinting of what a good company is like. I sort of redid my Japanese Computer Threat piece as an analyst's report, which bothered my boss because he wanted me to be writing about specific companies.

But our biggest client from JP Morgan called up and said, "Who *is* the girl who wrote this thing? This is good!" And suddenly, "Oh Esther, you're so smart, you wrote this great thing..."

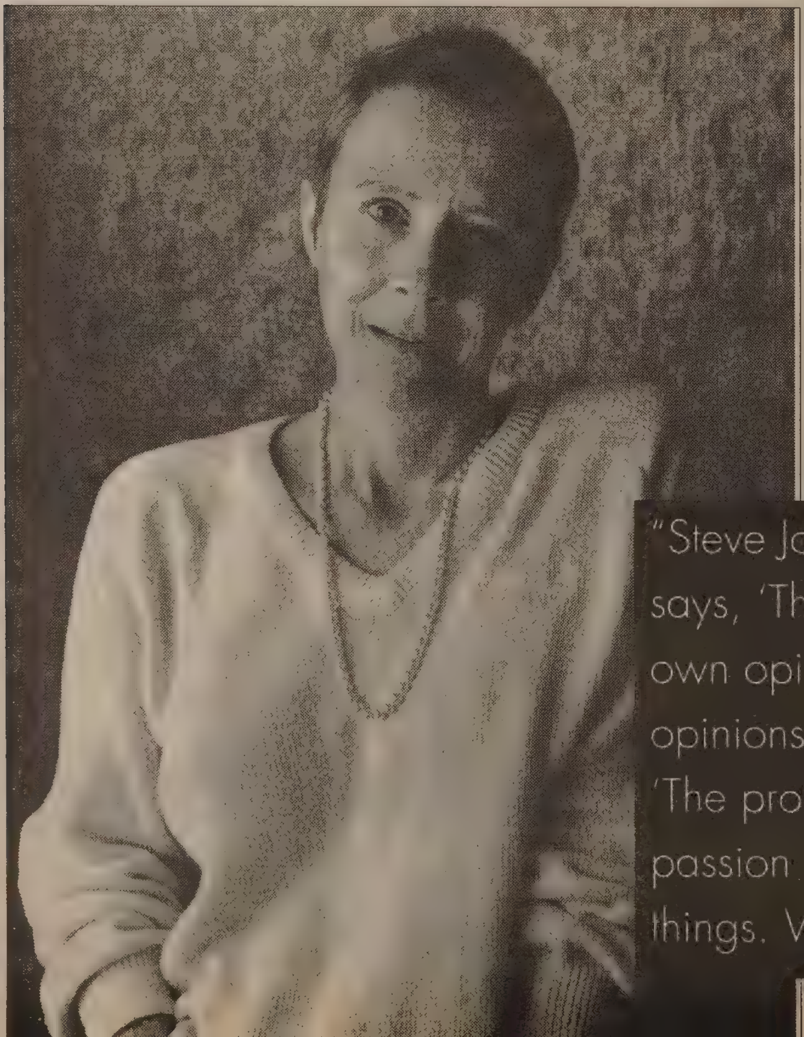
After two years there, I went to Oppenheimer and Company. At New Court, I was the research department; my boss was the sales department; there was one sales guy. It was great, because I learned everything. But I wanted to go to someplace more normal and establishment. Which I did, and I lasted about two years there.

Then I called up Ben Rosen who had, a year earlier, asked me if I wanted to come and write his newsletter for him.

What was he doing at that point?

He had left Morgan Stanley two years earlier. He had been the dean of the semiconductor analysts at Morgan Stanley. He knew this guy at Intel called Mike Markkula, who introduced him to this other guy called Steve Jobs. He brought the Apple IPO business into Morgan Stanley, and was honored but, he felt, not sufficiently rewarded or whatever. He left to start his own company called Rosen Research, and what had been the Morgan Stanley Electronics Letter became the Rosen Electronics Letter.

PHOTO: CHUCK GATHARD



This was before Sevin Rosen?

Well, Sevin Rosen, which was his venture capital firm, started sort of at the same time, and that was his problem. He had a conflict of interest. Which is why he wanted to hire somebody to write the newsletter.

But it turned out everybody said, "Oh yeah, Ben's got this girl writing for him, who's probably just saying what he tells her to say. He's got a conflict of interest."

It was not at all true, but that's okay.

The most memorable time was when the Lisa had just come out, and I wrote something about it that I thought was fairly balanced: "It's pretty cool, but it's pretty slow, and it costs too much, but it's really neat and it has some neat ideas."

And Ben, who was now chairman of Compaq, read this, and he said, "Gee, that's much too favorable. And I said, "Well, maybe, but this is what I think."

So I didn't change a word of it.

Steve Jobs reads it, and he says, "This is really terrible. It's okay if you have your own opinions, but trying to pass off your crummy opinions as those of Ben Rosen..." Then he said, "The problem with you, Esther, is you don't have any passion for this industry. You don't care about these things. What you really need is a good boyfriend."

Anyway, Ben and I decided that Ben had to sell the newsletter, because his having me write it wasn't enough. We talked to someone we knew at McGraw-Hill. We talked to someone at IDG. The response of both of them was a little too weird.

So in a blinding flash of insight it was totally obvious—I should buy it. So Ben took some cash out, in what was a leveraged buyout, although the term wasn't really being used at the time. And I got the business, including the conference.

Ben had started it when he was still at Morgan Stanley. He had this annual semiconductor conference, and, I think in '77 he decided, well, we'll have this little side-conference one of the afternoons about personal computers. And that was the first PC Forum.

Mike Markkula came and spoke about the new standard, the BASIC language. I think Nolan Bushnell was there. I wasn't, of course. I started going in '79 or '80. But by the time I joined Ben I'd been to several.

Were they pretty much like they are now?

Well, they were much smaller, and much less establishment, because it was the same people, but they were not yet the establishment. They were much more open to new ideas, they were open to new people, and were much more willing to share—"This is how we did it."

I liked this year [1993] better because there were more small companies, and you got more of that. The year before, you got much more of "how great we are," or "why you should use us"—they're not trying to sell products, but they are trying to sell *de facto* standards. This year was much more like the old days in that respect. This year I did what [Voyager's] Bob Stein said, which was, I designed it for myself.

What's really nice is everybody hanging out and everybody talking to each other, the strange connections in the hallways.

Yeah. I love it when people come up to me later and tell me, "I made a deal with so-and-so there." Two people who met at my conference in Warsaw are getting married in June. So that's always fun.

> "Steve Jobs reads my review of the Lisa, and he says, 'This is really terrible. It's okay if you have your own opinions, but trying to pass off your crummy opinions as those of Ben Rosen...' Then he said, 'The problem with you, Esther, is you don't have any passion for this industry. You don't care about these things. What you really need is a good boyfriend.'"

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"I love it when people come up to me later and tell me, 'I made a deal with so-and-so there.' Two people who met at my conference in Warsaw are getting married in June. So that's always fun."

I try to put new stuff in there. And I try to expose people to new ideas. Which, the first year or two, they don't get.

How did you get involved with the Eastern European and Russian stuff?

Well, I learned Russian when I was 14, in high school.

My father was a scientist, and he'd been to Russia a few times. In our family we knew the Russians were good, even though the Soviets were bad. I already knew German some and I knew French pretty well, because I'd been taking that since third grade, so it was Russian or Spanish or music appreciation or something. So I decided to learn Russian.

I always wanted to go there, but I didn't want to be a tourist, which meant that I never went until about four years ago. On New Year's Day [1989] I was having lunch with Gary Chapman [of CPSR]. He mentioned he was going to Russia with Sherry Turkle in April. I said, "Oh great! can I be your interpreter?"

He called my bluff, and the three of us went. It was really hilarious, because the three of us were a motley crew; we have no possible business purpose. This group who had invited us, the International Computer Club, was basically a trade association of computer users—it was quasi-government.

While we were there, there was also a delegation of real live German businessmen. So they completely ignored us, and we did what we liked. They arranged one or two meetings for us, and we went to a conference out in Suzdal about the informatization of Soviet society. There was a guy there who got up in the afternoon, and he said, "I'm from Estonia, and when we talk about the informatiziation of society, let's not forget the Estonians, it's not just Russians." He gave this impassioned speech.

It was an interesting time. They had just had the first Congress of People's Deputies, and everybody was excited, and they were probably more hopeful than they've ever been since.

I was giving this talk, and, since I'd come over as CPSR after a fashion, I decided to talk about some of these issues, such as privacy.

I said, "How many of you are afraid of your government? How many of you would be scared of your government if it knew all this information about you?" And I expected sort of dead silence.

And they all raised their hands and started laughing. [laughs] I was amazed. It was very funny.

Everybody we ran into—forget that none of us had any business to do—was asking, "Would you like to do a joint venture?" And we'd say, "To do what?" And they said, "Oh, I dunno, but, would you like to do a joint venture?"

I had brought James Gleick's book *Chaos*, I brought Francisco Varela's *The Tree of Knowledge*, and some others—meaty mind-expanding books, not crappy novels. I brought Sherry Turkle's book[*The Second Self*]; it was interesting to read it while she was there. It was incredibly synergistic.

In Russia, you sit around waiting an awful lot, and I lost my temper a couple of times because people were so damn slow, and they were always late, and we were always late, and I thought that was rude. And they said, "Just relax, Esther!"

While I was waiting I read these books, and they gave me a new way of thinking, and Russia gave me a completely new world to think about. In the end I learned more about the United States, because I learned more about the assumptions I was living by when I saw what life was like without them. It was a magical time.

I wrote a piece for my newsletter *Release 1.0* called "Three Weeks That Shook My World." I thought, "Well, this is over; I'll write this piece, but there's not really a whole lot to do there."

And then in October one of the people I had met invited me back on some godforsaken Young Executives tour.

This was the fall of '89—the earthquake in San Francisco. The day after we arrived, we heard that California had sunk into the sea, basically, and we couldn't get any more information. It took a day or two to get a phone call through, and you couldn't call California at all.

We went to Estonia and they had a guide for us, and they were having this very boring lunch with some local dignitaries, and I turned to the tour guide, who was actually moonlighting—her normal job was being a dentist in a dental clinic. I said, "Let's go see your dental clinic." She said, "You're sure you don't want to see the museum?" "*No!*"

So we went to see her dental clinic…

It was an awful trip, but was still sort of fun, and I wrote that one up.

And then in December I went for the third time, and the first day was sheer horror. It's always like this the first day—it's just, "Why did I come back here? I really can't help these people. It's sort of stupid. What am I doing here? I'm only here for three days. It was really stupid to come."

This was a bunch of people organized by a guy I knew, about five, including two people from Met Life, kind of looking at the Russian computer business. They had arranged to go and visit Zelenograd, which is one of these military-industrial complexes just northwest of Moscow, and we were pretty close to the first Westerners. It was a pretty special thing.

But it was deadly. They had an interpreter, which meant everything lasted twice as long. They gave interminable speeches, and it was just incredibly boring.

The second day I told them I was very sorry, I had arranged some appointments, which is a complete lie, and I didn't go. I went and saw some people I knew, and the whole thing got much better. The third day I went and it was fine. We stayed for about a week and I did various things and saw various people with the group.

I went to Budapest because I'd just decided it was time to do more than just Russia if I was going to be serious about this at all, and get any Western companies interested. So I was in Budapest over the Christmas weekend when the Ceaucescus were executed; that was about 200 miles away. It was all over Hungarian TV, not just the execution, but the Romanian riots, and all this stuff. The village where it all started was mostly Hungarian. People were in anguish.

The most amazing thing happened. I felt very homesick for Moscow. The next year, 1990, we had our first Forum in Budapest. Barlow came, Mitch came.

The biggest hero was Bill Joy. There were a lot of UNIX guys there, and Bill Joy spoke to a breakout session for four hours. And these people were sitting there delighted with every moment. It was just magical.

[Microsoft's] Charles Simonyi came—he's Hungarian, and for all the Hungarians that was really a thrill. His father still lives there, so he went to see his father.

Rustem Akhiarov, who now runs the software development department of a large successful Russian company—at the time he looked as if he'd escaped from kindergarten, with a long ponytail. He was beside himself at the thrill of meeting Barlow, who he knew about.

Mitch talked about being an entrepreneur and starting Lotus.

We played the Hawaii tapes, the first Apple sales meeting for the Macintosh. Steve Jobs was MC, with Fred Gibbons, Mitch Kapor and Bill Gates. These were the big three software companies, so these three presidents were there, sitting

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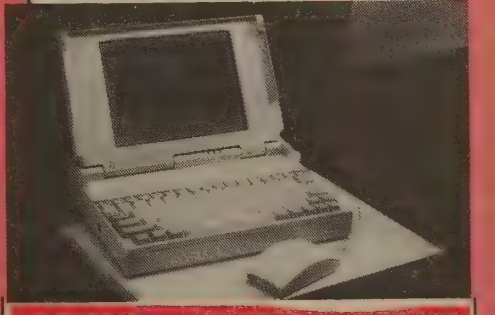

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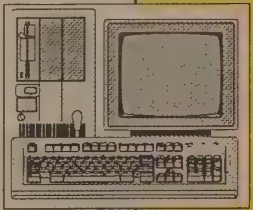

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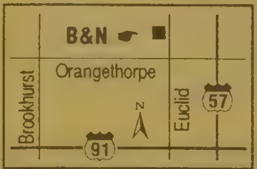

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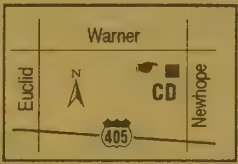

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on large stools, and they were doing the software Dating Game. Steve was asking what they wanted in a hardware company.

Steve asked them their favorite three letters, and Fred said "M-A-C, S-E-X..." and then he sort of cracked up.

It was wonderful in that they were so young, and all this history was before them, and I thought it was a nice thing to show these people how our industry began in the West. And of course Mitch was there, so it was fun to see him ten years ago...

It was pretty neat.

And there've been two more conferences since then?

There was Warsaw, and then there was Prague, and this year probably Slovenia.

The community mostly doesn't exist yet. In Hungary, they all know each other. In Poland, less so. In Czechoslovakia, less so. They tend to talk to their customers, but not to each other. And until you know your competitors, you can't differentiate properly.

A funny, good thing happened though. I was talking to two of the Hungarians who had actually been at PC Forum, and also at East/West High Tech Forum, and we were talking about Slovenia. I said, "So yeah, it's going to be in Ljubljana." And this Hungarian said, "Ljubljana? You'll only get second-rate people there. You really should go somewhere real like Budapest." This same guy also said that he really didn't think it was appropriate to have all these Russians with more developed countries like Hungary and Czechoslovakia.

And of course this is exactly what everybody said three years ago about Budapest.

The moral of it is how quickly people become establishment and try to keep the people below them on the ladder down.

It was also the point I was trying to make with the Hawaii tape—even in those days they had picked the three establishment companies, and they picked completely wrong, with the exception of Microsoft. They missed Aldus.

So what do you see as your role in developing the Eastern European scene?

Well, the same as here. Find the new guys, and, to the extent that I can, help them discover each other and get self respect. You know, pass on knowledge.

The parallel that's simplest is Ben brought the PC community to the attention of Wall Street, and I'm trying to bring Eastern Europe to the attention of Western vendors. That's a somewhat grandiose statement, but that's what it's all about.

Eastern Europe doesn't need money as much as it needs business skills. It doesn't need technology. It needs stuff to buy, like hardware, but what it really needs is knowledge of how to run a company, how to support your customers. It needs more sense of community, too.

What is your sense of how many people are doing joint ventures with outside countries, and what people are doing domestic stuff?

As a percentage of the real market foreign activity is uncomfortably large, in the sense that it would be nicer if it were more Russian, although the foreign capital and know-how are available. But there's a lot of fairly large firms that are now Russian-controlled.

And it's changed a lot. In the beginning it was virtually all outside capital, or little programmer collectives. There is now Steepler, Intermicro, Microinform, 1C—1C was a spinoff of the Lotus distributorship, and that's what's finally happening. People are learning how to do this, and then they're going out and starting it for themselves, which is great.

But what's also neat is some of them are now coming to PC Forum, which I like. They're being pretty much ignored, but time will change that.

What do they do?

They come and they listen and they meet a few people, and next year they'll come and they'll do more of it. It's hard for small Western companies too; they get ignored. It's hard to break in, whether you're a small Eastern company or a small Western one. And in the scheme of things, it's got to be, because there's only so much time anybody has to meet new people, as opposed to doing their old business.

But it would be beneficial if it was a little more open.

At one of Dick Shaffer's conferences last year, one of the panelists said that what's going on essentially is that we're back in 1977 and everything is changing. And everybody who's on top now might not be later.

Absolutely. That's the whole point.

Just as mini and mainframe people couldn't really do the PC business right, the PC guys don't know about wireless and PDAs. It is a different marketplace, and even if a lot of technology is the same under the covers...

The alliances have to be different.

Yeah, and you need more alliances, which is the other point. You could start a PC company in your garage. Even if you're in your garage you could go out and hire a lawyer, and you could get parts from Fry's.

But if you want to do a communications company, you have to deal with the infrastructure and the government. That's very different for a lot of these people, who built their lives on being independent and avoiding dealing with the government. There are legal issues, and intellectual property, maybe.

They're growing up now, and they have to deal with grown-up problems, which is a drag. It's not fun. You have responsibilities.

Do you have a sense of some of the big companies being smarter than others about some of this?

Yeah, I'm amazed at AT&T. Good for Kavner.

Apple may actually be one of the counterexamples. I really like the Newton; I'm not sure if Apple understands how to market in the new markets.

What about content?

It's the revenge of the little guy—you need to use the infrastructure out there, but you can be small and you can be nichey. In content, you inherently are, in fact.

How do you see all the intellectual property issues getting resolved?

How should they be resolved, or how will they? We'll muddle along and do little things here and there.

I believe in strong intellectual property rights, but I think as a business issue nine times out of ten you're better off giving almost everything away except for one piece. And that piece is what you earn your rent on.

As a practical example, what do you mean by that?

You know, like Adobe. Except for the very protected code of the interpreter, you can use PostScript pretty freely. Or, what Apple should have done with the Mac, encourage clones. I think that was a business mistake. It's amazing they overcame it.

And a counterexample is Datapoint, which had Arcnet long before Ethernet, but because they kept it proprietary they never got anywhere with it.

In terms of intellectual property on content, it gets much more complicated, but fundamentally people in computer industries just don't see the tradeoff part. If you own real estate, you have to go to a lot of expense to do a title search, you need to pay real estate taxes, you need to do things to protect your property rights. There's a whole bunch of people fundamentally doing what the Soviets would say is useless work, defining and protecting those property rights in land.

Computer people think, "Well, this is really inefficient, having all these monitoring and metering schemes and stuff." But that is part of the friction. Because somebody will write a great code for love. But somebody will support it, will document it, will do the printer driver as opposed to the beautiful elegant design—they'll do that for money.

I'd be comfortable with something like a much shorter copyright term, five to ten years. Because after that, in this industry at least, it's pretty academic anyway.

On the other hand I really like the Cygnus model—which is, the software's free, we'll just charge for the service part of it. I'd like a world in which you could do the Cygnus model, but it wasn't forced on you. I think [the Free Software Foundation's Richard] Stallman is fine in what he's doing; I do not agree with him in what he's trying to impose on other people. It's fine, you can write stuff and you can force people to give it away freely, and that's okay. But you shouldn't force other people to give their stuff away freely.

At least in public, Stallman backs off from that a little. There are people who would like to characterize Stallman as a thief

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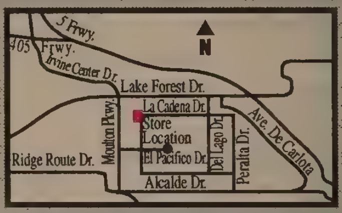

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Mini/Dock/Dock HD230 FPU	$510.44/928.07/1716.94
Duo Floppy Adaptor/Floppy Drive	$129.93/180.98
One Scanner/Color One Scanner	$858.47/1238.98
Apple 12"/Basic/14"/16"	$194.90/301.62/487.24/1136.89
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Apple CD300 External	$533.64
Apple Powered Speakers	$153.13
Magnavox 14" Monitor	$338.75

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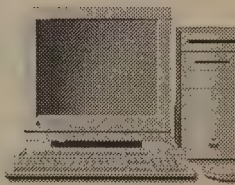

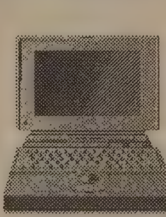

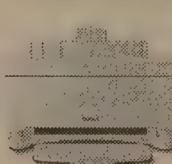

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continued from page 42

people all over the globe. The text of this article was transmitted by commercial email to *MicroTimes'* main office. Because email automatically eliminates the problems of reaching people who work out of several locations or in different time zones, it's an inexpensive and effective way to keep teleworkers in closer touch with people at the home office.

Online Databases. Not all teleworkers need access to a company's computerized information. But those who do can benefit from technology making this information available over telephone lines. Bulletin boards, dial-in systems, and other computer devices make it simple, fast, and inexpensive to provide vast amounts of data to people working from home or distant offices. Using online databases also helps eliminate the problems of lugging heavy reference works, updating old manuals with the latest information, and worrying that printed materials containing confidential information will fall into the wrong hands.

PORTABLE INFORMATION DEVICES

Because teleworkers have at least two desks, one in the main office and one or more elsewhere, portability is a valuable attribute for everything they use a great deal. That's why more and more teleworkers are making use of three new technologies: portable reference devices, personal organizers, and laptop computers.

Portable Reference Devices. These "databook" devices provide a small, battery-powered screen on which to read books, encyclopedias, and other reference works recorded on interchangeable cartridges or disks. Nearly one in three teleworker households now own a portable reference device.

Personal Organizers. These are elaborate systems to record names, addresses, and telephone numbers, as well as appointment schedules and notes on meetings. For years, small notebooks with loose-leaf pages have been popular for this purpose. More recently, electronic versions have appeared that are smaller, lighter, more capacious and even somewhat automated. Both reference devices and organizers are gaining in popularity among teleworkers because they greatly reduce the bulk and weight of the information the teleworker must carry from place to place.

Laptop computers. Years ago, laptop computers were simple devices that only mimicked some of the simpler capabilities of desktop-size business computers. Today, laptops match all the power, speed, memory, and even color-screen capabilities of their larger cousins. Although keyboards are somewhat smaller, the best laptop keyboards provide the same spacing and feel as standard-size ones. The result: it's possible to put all your computer work into a machine the size of a small-town telephone book that weighs under six pounds, and carry it with you from home, to car, to office, and beyond. ■

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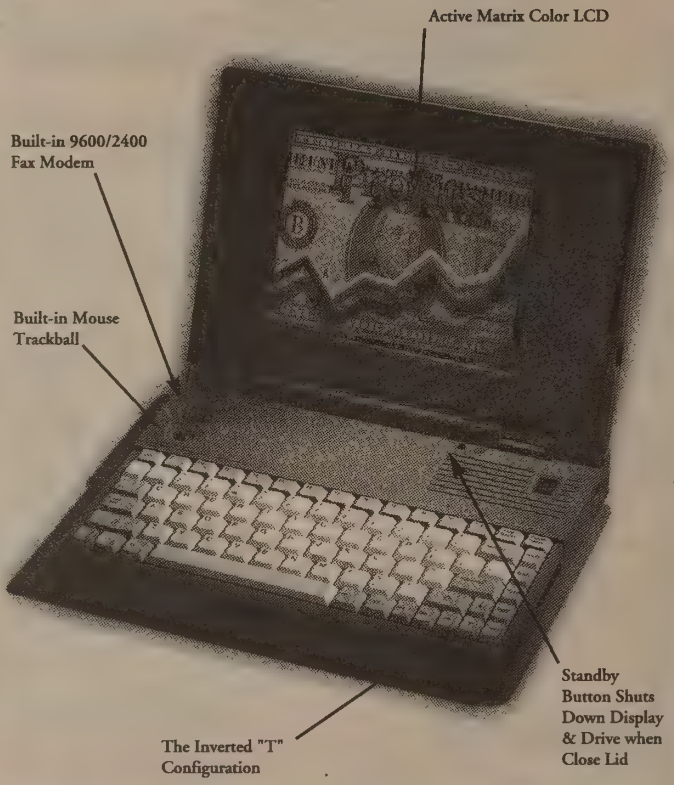
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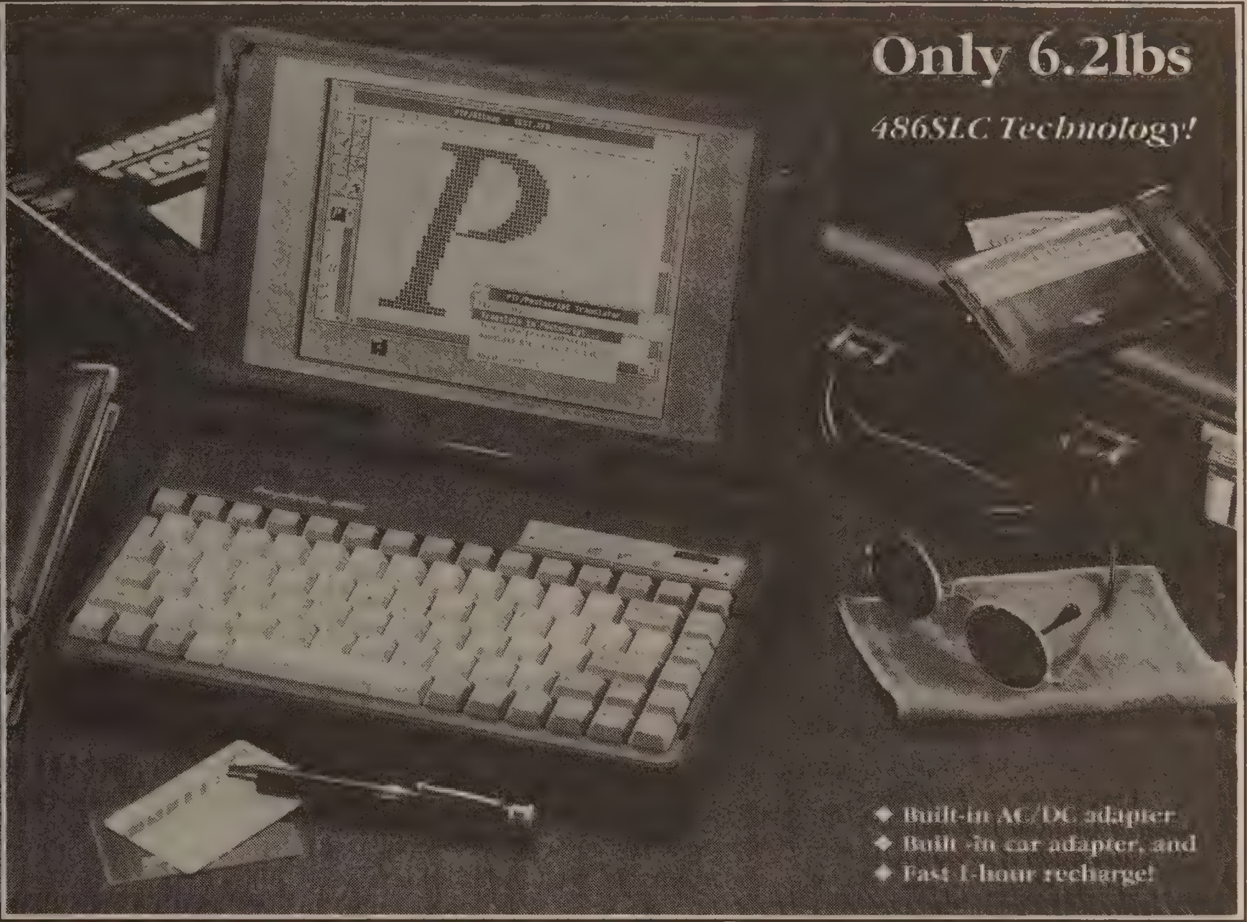

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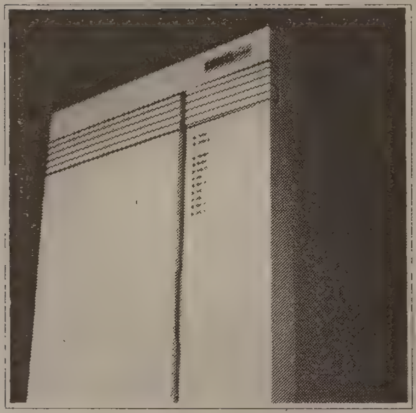
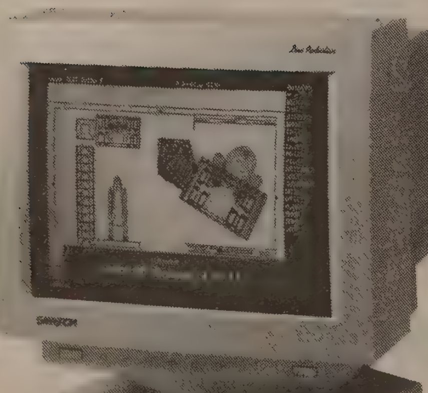


The Gemini ProFile series of fault-tolerant file servers was designed for use with Novell's NetWare SFT III to eliminate system downtime due to failure of a single file server. Mirrored twin servers provide a new level of fault-tolerant capabilities to networked computing systems. Large enterprise users can now safely migrate business-critical applications to economical LAN environments. The Gemini ProFile may be ordered to fit your needs. A typical system consists of twin servers configured with Intel 486DX2, 66MHz, 16MB of RAM, EISA SCSI hard/floppy controller, 500MB SCSI hard drives, 1.2MB and 1.44MB floppy drives, Novell Mirror Server Link cards, and two serial and one parallel port. ($19,500) UNIQ Technologies, Inc., 49090 Milmont Dr., Fremont, CA 94538. (510)226-9988.

PICTURE PERFECT FRAME GRABBER

Picture Perfect is a 24-bit RGB, live-motion video and frame grabber card capable of displaying 16.7 million high-resolution colors in real time. Picture Perfect allows users to utilize the capabilities of Super VGA, Windows accelerators, or Local Bus display cards. Its sixteen fractional random zooming steps give users smooth zooming capability. In addition, Picture Perfect's flexible design offers the ability to upgrade the display resolution and add on-board VGA displays, compression/decompression, or PC-to-TV decoder daughter cards. In-Motion Corp., 46731 Fremont Blvd., Fremont, CA 94538. (510)651-2626.



SAMTRON LOW-EMISSION 15" DISPLAY

The SC-528DXL, Samtron's new 15" low-emissions non-interlaced Enhanced Super VGA color monitor, is manufactured to meet the Swedish MPR II guidelines for VLMF (very low magnetic field) monitors. Ergonomic features include tilt-and-swivel stand, front access screen controls,

Continued on page 70

PRODUCT UPDATES

➤ **Aladdin Systems** introduced a special program for owners of non-Aladdin compression products to trade up to **StuffIt Deluxe** ($45), **StuffIt SpaceSaver** ($25), or **StuffIt Lite** ($15). Aladdin Systems, Inc., 165 Westridge Dr., Watsonville, CA 95076. (408)761-6200. AppleLink/AOL: ALADDIN.

➤ **Altima Systems** launched a promotion whereby new customers of any **Altima 486 Series notebook** who also purchase the accompanying accessory package will receive a redeemable certificate for an Audiovox PRO-95 transportable cellular phone free. Altima Systems, Inc., 1390 Willow Pass Rd., Suite 150, Concord, CA 94520. (510)356-5600.

➤ **Casa Blanca Works** released **Drive7 v2.3.4**the universal drive formatting software for the Macintosh. Major improvements include support for SyQuest/SCSI Probe standardization guidelines as well as formatting support for SyQuest "C" drives. Casa Blanca Works, Inc., 148 Bon Air Center, Greenbrae, CA 94904. (415)461-2227.

➤ **Dantz Development** announced that **Retrospect Remote 2.0 for A/UX** will be bundled with all configurations of the **Apple Workgroup Server 95**. Dantz Development Corp., 1400 Shattuck Ave., Berkeley, CA 94709. (510)849-0293. AppleLink: DANTZ.

➤ **Extended Systems** has reduced the price of two models of its **ExtendNet** product line by $200: **ExtendNet ESI-2856A** and **ExtendNet ESI-2866A**. Extended Systems, Inc., 5777 N. Meeker Ave., Boise, ID 83704. 1-800-235-7576.

➤ **Intelligent Security Systems** announced an upgrade for its **FIRMLOC PC** access control system. Intelligent Security Systems, Inc., PO Box 1133, Addison, TX 75001-1133. 1-800-237-4774, (214)315-1254.

➤ **MicroSpeed**, designers of utility software and input devices, has launched **Tracking with Education**, a low-cost acquisition program for educators. This program will provide school districts with reduced process on MicroSpeed's trackballs for Apple II series, Apple Macintosh, and IBM PC and compatible computers. MicroSpeed, Inc., 5005 Brandin Court, Fremont, CA 94538. 1-800-232-7888.

➤ **Opcode Systems** announced **OMS v2.0**, as well as changing the acronym from Opcode MIDI System to Open Music System to reflect the fact that future versions will incorporate source code from other developers. Opcode Systems, Inc., 3950 Fabian Way, Suite 100, Palo Alto, CA 94303. (415)856-3333.

➤ **Software Publishing Corp.** introduced its **Subscribe Program**, a two-year software upgrade agreement for corporate users of graphics and database software products. This program differentiates itself from similar long-term upgrade programs by requiring a low minimum qualification of only fifty units. Software Publishing Corp., 3165 Kifer Rd., PO Box 54983, Santa Clara, CA 95056-0983.

➤ **WordPerfect Corp.** released **WordPerfect 6.0 for DOS**. Upgrades for existing customers will have a retail price of $129. A competitive trade-up package will be available for $149. WordPerfect Corp., 15550 N. Technology Way, Orem, UT 84057-2399. (801)225-5000.

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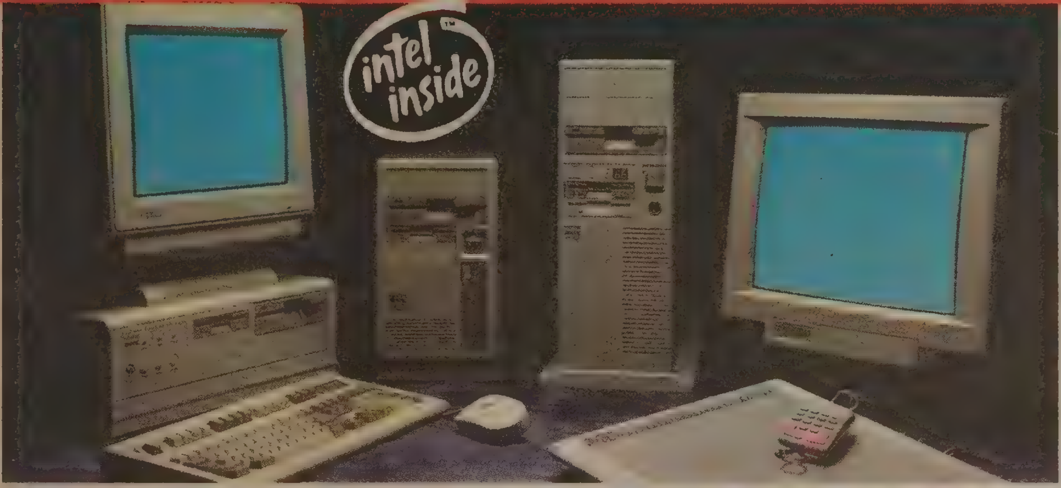

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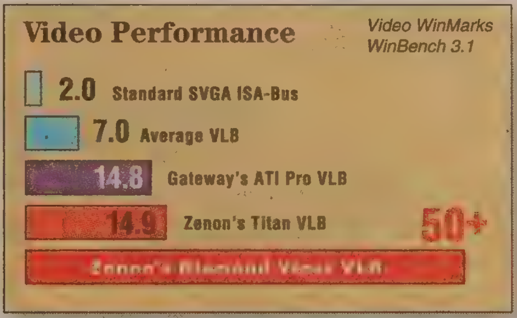

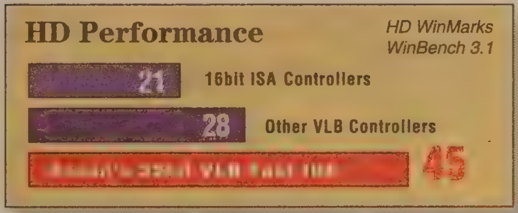

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120 Mb IDE (Connor, 15Ms)	$200
210 Mb IDE(Maxtor, 15 Ms)	$250
245 Mb IDE (Maxtor, 15Ms)	$285
338 Mb IDE(Maxtor, 15Ms)	$375
1.2 Gb SCSI(Maxtor, 8.5 Ms)	$1400
1.7 Gb SCSI(Maxtor, 13 Ms)	$1350
255 Mb IDE(WD, 13 Ms)	$250
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MOTHER BOARDS

386-40 Mhz W/128K Cache W/Cpu	$150
486-33 Mhz W/256K Cache W/Out Cpu	$115
486-33 Mhz W/256K Cache DLC W/Cpu	$275
486-66Mhz W/256K Cache W/Out Cpu	$125
486-50Mhz W/256K Cache W/Out	$135

EISA MOTHERBOARD (A.I.R)

486-50Mhz W/256K Cache W/Out Cpu	$595

VIDEO CARDS

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Svga Card (Trident, 1 Mb, 1024 x 768)	$55
Diamond 24x Hi-Color (1 Mb)	$165
Diamond Stealth 24 Hi-Color (1 Mb)	$175
Diamond Viper VLB (2 Mb)	$405
Orchid Fahrenheit VLB Svga Card (1 Mb)	$190
Orchid Fahrenheit VLB Svga Card(3 Mb)	$435
ATI Graphic Ultra (1 Mb Vram)	$250
ATI Graphic Ultra Pro (2 Mb)	$530
ATI Graphic Ultra Pro EISA (2 Mb)	$600
ATI Graphic Ultra Pro VLB (2 Mb)	$420

MODEMS

Smartlink 2400 Baud Modem	$35
Accex Fax/Modem (9600/2400 B)	$55
INTEL 14.4K Fax/Modem (400A)	$400

LOCAL BUS MOTHERBOARD (AMPTRON / A.I.R)

486-33/66 Mhz W/256K Cache W/Out Cpu	$150
486-33/66 Mhz W/256K Cache W/Out Cpu	$235

MONITORS

Tatung Monitor (14", 0.39 Dpi, 1024 x 768)	$225
Arcus Monitor (14", 0.28 Dpi, 1024 x 768)	$245
Arcus Monitor (14", 1024 x 768, N-I)	$300
Arcus Monitor (15", 1280 x 1024, N-I)	$450
Shamrock (14",1024x768,N-I)	$275
Mag Monitor (15", 0.28 Dpi, 1280 x 1024)	$550
Mag Monitor (17", 0.26 Dpi,1280 x 1024)	$975

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INVISIBLE LAN - 200 Users Terminal Software,
- Two 16 Bits Ethernet Card
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486 - 33 MHz SPECIALS

4 MB RAM
256 KB Cache
1.2 & 1.44 MB Floppy Drive
2S / 1P / 1G
120 MB IDE Hard Drive
Enhanced Key Board
Mini Vert. or Desktop0 Case
200 W. Power Supply
SVGA Card (1MB)
SVGA 1024 x 768 Monitor
Serial Mouse

$1219

486 - 50 MHz CAD Station

4 MB RAM
256 KB Cache
1.2 & 1.44 MB Floppy Drive
2S / 1P / 1G
210 MB IDE Hard Drive
Enhanced Key Board
Mini Vert. or Desktopl Case
SVGA Card (1 MB)
Arcus SVGA N-I 15" Monitor
(1280X1024).28mm)
Serial Mouse

$1569

486 - 50 MHz CAD Station

8 MB RAM
256 KB Cache
1.2 & 1.44 MB Floppy Drive
2S / 1P / 1G
245 MB IDE Hard Drive
Focus 2001 Key Board
Full Size Vertical Case
230 W. Power Supply
ATI Graphic Ultra (1 MB)
Arcus 15" N-I Monitor
(1280X1024 0.28mm)
Serial Mouse

$1969

486 - 66 MHz DX2 Station

8 MB RAM
256 KB Cache
1.2 & 1.44 MB Floppy Drive
2S / 1P / 1G
245 MB IDE Hard Drive
Focus 9000 Key Board
Full Size Vertical Case
230 W. Power Supply
ATI Graphic Ultra (1MB)
ARCUS 15" N-I Monitor
(1280X1024 0.28mm)
Serial Mouse

$2105

486DX(2) - 33/66 VLB EISA Standard

EISA Local Bus Mother Board
8 MB RAM
256 KB Cache
1.2 & 1.44 MB Floppy Drive
32 Bit VESA IDE HD & FD Controller
WD 340 MB IDE Hard Drive
Vertical Case (230 W. P/S)
Orchid FahrenheitVLB VGA
(1 MB VRAM)
Arcus 15" Non-Interlaced Monitor
(1280 X 1024, 0.28 DPI)
Serial Mouse
Focus 2001 Keys Key Board

$1939 / 2249

Pentium Overdrive Ready 486-33/66 MHz Vesa Local Bus

4 MB RAM
256 KB Cache
1.2 & 1.44 MB Floppy Drive
2S / 1P / 1G
210 MB IDE Hard Drive
Full Size Vertical Case (2 Cooling Fans)
Cirrus Logic Local Bus VGA Card
14" SVGA Monitor (1024 X 768 @ N - I)
Serial Mouse

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486DX - 50 EISA Intel EISA Controller Chipset

A.I.R. EISA Mother Board
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256 KB Cache
1.2 & 1.44 MB Floppy Drive
2S / 1P / 1G
Maxtor 340 MB SCSI Hard Drive
ADAPTEC 1742 EISA SCSI Controller
Vertical Case (300 W. P/S)
ATI Graphics Ultra-ProEISA VGA
(2 MB VRAM)
MAG 17" Non-Interlaced Monitor
(1280 X 1024, 0.28 DPI)
Focus 9000 124 Keys Key Board

$3859

486DX(2) - 33/66 VLB VESA-VL Standard

A.I.R. Local Bus Mother Board
8 MB RAM
256 KB Cache
1.2 & 1.44 MB Floppy Drive
2S / 1P / 1G
WD 250 MB IDE Hard Drive
Vertical Case (230 W. P/S)
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ATI Graphic Ultra Pro VLB VGA
(2 MB VRAM)
Focus 2001 Key Board
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MAG 15" SVGA Monitor (1280x1024)

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Computer Technology
A-1
1987-1993

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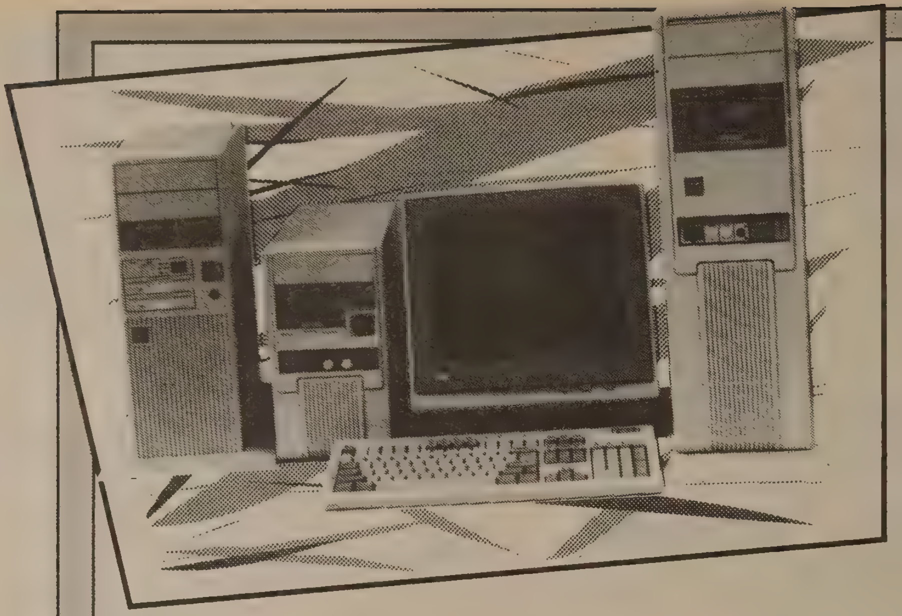

SHOPPING FOR THE

486 EISA + VESA LB System

- 486 CPU w/256K Cache
- 4MB RAM
- 1.44 Floppy Drive
- VLB 32 Bit IDE HD/FD w/I/O
- AT I/O Card
- 101 Enhanced Keyboard
- Vertical Case & Power Supply
- SVGA Monitor, .28dp
- VLB 32 Bit SVGA 1MB Card (1280x1024 Res.)
- 210MB Hard Drive

33MHz EISA VLB	$1390
50DX2 EISA VLB	$1500
50DX EISA VLB	$1545
66DX2 EISA VLB	$1625

486 VESA Local Bus System

- 486 CPU w/128K upgradable to 256K
- 4MB RAM
- 1.44 Floppy Drive
- VLB 32 Bit IDE HD/FD w/I/O
- AT I/O Card
- 101 Enhanced Keyboard
- Vertical Case & Power Supply
- VLB 32 Bit SVGA 1MB Card (1280x1024 Res.)
- SVGA Monitor, .28dp
- 170MB Hard Drive

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SX 33MHz VESA LB	$1195
33MHz VESA LB	$1289
50DX2 VESA LB	$1400
50DX VESA LB	$1440
66DX2 VESA LB	$1519

486 Caching System

- 486 CPU w/128K Cache
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- 16 Bit Dual (1:1) HD/FD Controller
- AT I/O Card
- 101 Enhanced Keyboard
- AT Vertical Case w/Power Supply
- SVGA Monitor & SVGA w/1MB
- 170MB Hard Drive
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50DX MHz	$1325
66DX2 MHz	$1405

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- 16MB RAM
- 1.44 Floppy Drive
- VLB IDE HD/FD Controller w/I/O
- AT Full Size Case w/Power Supply
- Dual FAN On The System
- 101 Enhanced Keyboard
- VLB 32 Bit SVGA 1MB Card (1280x1024 Res.)
- 15" SVGA Monitor (1280x1024 Res., .28dp N-I)
- 245MB Hard Drive

$2285

386-40MHz Cache System

- 386 CPU w/128K Cache
- 4MB RAM
- 1.44 Floppy Drive
- 16 Bit Dual (1:1) HD/FD Controller
- AT I/O Card
- 101 Enhanced Keyboard
- AT Vertical Case w/Power Supply
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ISA 486DX-50MHz w/128K Cache	$495
ISA 486DX2-50MHz w/128K Cache	$470
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ISA 386-40MHz w/64K Cache	$139
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ISA 486SX-33MHz w/128K Cache	$330
ISA 386SX-33MHz	$79
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ATi Graphic Ultra Plus w/2MB DRAM	$289
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VLB Cirrus Logic w/1MB Upgrade To 2MB	$120
VLB OAK Chipset w/1MB Upgrade To 2MB	$109
VLB GENOA w/1MB (1280x1024 Res.)	$129
VLB ET4000/32 (1280x1024 Res.)	$145
VLB ATi Graphic Ultra Pro w/2MB VRAM	$395
VLB Diamond VIPER w/2MB VRAM	$395
VLB Fahrenheit VA w/1MB Upgradable To 2MB	$195

MONITOR

VGA Monitor	$195
14" SVGA 1024x768, .39dp	$235
14" SVGA 1024x768, .28dp	$255
14" SunShine 1024x768, .28dp N-I	$275
14" PROTON 1280x1024, 72Hz, .28dp	$310
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17" SunShine 1280x1024, N-I .26dp	$695

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IDE 210MB Hard Drive	$230
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SCSI 210MB Hard Drive	$345
SCSI 340MB Hard Drive	$595
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Tape Backup Colorado DJ-20	$195
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External 14.4 Fax 14.4 Modem	$205

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Ethernet 8 Bit (NE1000)	$88
Ethernet 16 Bit (NE2000)	$95
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GALLANT SC5000 • 16 Bit Sound Card • Includes Speakers, Microphone & $500 Worth Of Software	$129
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Amplified Speakers, Shielded, Volume Control	$25

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2400 Internal Modem	$25
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96/96/24 S&R Fax Modem Dos/Windows	$49/$52
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9600 Internal Modem V.42bis	$125
96/96/96 S&R Fax Modem V.42bis	$145
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• Super IDE Controller 2S,1P,1G	$14
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• 256K SVGA Card	$25
• 512K SVGA Card	$35
• 1 Meg Trident SVGA Card	$55
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• Medium/Full Tower Case 230W Power Supply	$69/$89
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STORE LOCATION

Continued from page 64

and an etched and polarized nonglare screen, plus multifrequency VGA and VESA capability. In addition, the SC-528DXL comes with a one-year parts and labor warranty. ($650) Samtron Display, Inc., 14251 E. Firestone Blvd., Suite 101, La Mirada, CA 90638. (310)802-8425.

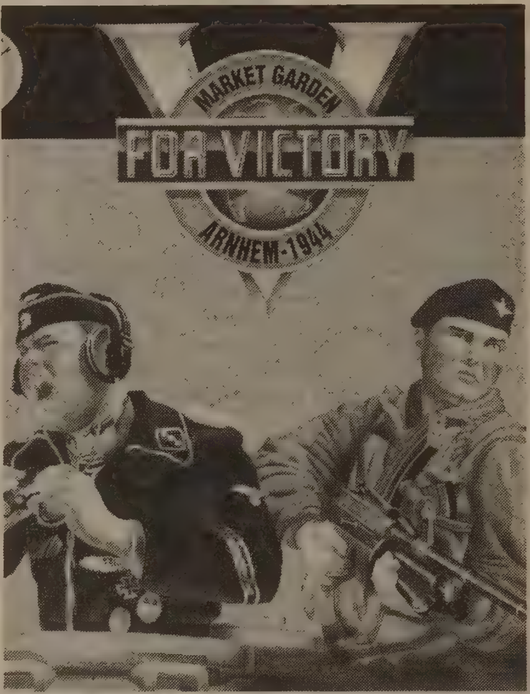
REVIEWS

GAME REVIEWS

By Mike Markowitz

V FOR VICTORY: MARKET GARDEN 1944

Designed By: Eric Young, Ed Rains
Programmed By: Keith Zabalaoui, Larry Merkel
Published By: Three-Sixty Pacific
For: MS-DOS (3MB RAM, Super VGA graphics, mouse required, supports AdLib and SoundBlaster audio cards); Macintosh (1MB, System 6.04 or later, color requires 2.5MB or more)
List Price: $69.95



There are sketches of parachutes in DaVinci's notebooks, but the notion that soldiers could gain tactical surprise by jumping out of airplanes was developed by the Soviets in the 1920s. In 1940, German parachutists captured key forts and bridges during the invasion of Belgium and the Netherlands. In 1941 a German parachute division took heavy losses in a risky but successful attempt to seize the island of Crete. The British and American armies quickly created their own "airborne" divisions, combining para-chutists and expendable gliders that could crash-land with heavier equip-ment. Very expensive to train and equip, these units required elite, slightly crazy

Continued on page 76

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14.4K Int. FAX/Modem	$199

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170IDE Hard Disk
Teac 1.2 MB Floppy Drive
Teac 1.44 MB Floppy Drive
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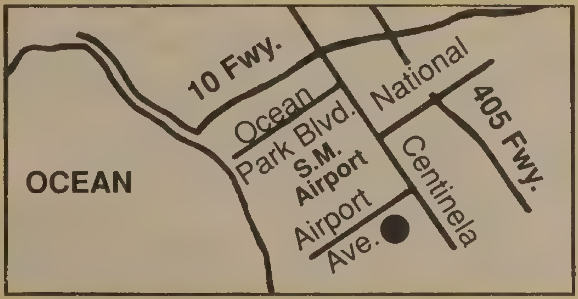
Monitor (1024 x 768, .28mm)
32-Bit VL Bus Windows Accelerator
Card w/1MB Memory
32-Bit VL Bus IDE Controller
2 Serial, 1 Parallel, 1 Game
101-key Keyboard
Serial Mouse
Dual Cooling Fan
Mid Tower Case with 230W P.S.

THETA

intel inside



NOTEBOOKS

Theta 486SX/25 85MB, 4MB RAM Mono	$1375
NEC Versa 486SL/25C 120MB, 4MB RAM Active Matrix	**Call**
IBM Thinkpad 700 486SLC/25, 120MB 4MB RAM, Mono	**Call**
Toshiba 4400C, 486SX/25 120MB, 4MB RAM Active Matrix	**Call**
Toshiba 4400C, 486DX/25 200MB, 4MB RAM Active Matrix	**Call**
Toshiba 1850, 386SX/25 120MB, 4MB RAM Dos, Windows, Mouse	**Call**

486DX-33 VESA Local Bus $1359

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32-Bit VL Bus Windows Accelerator
Card w/1MB Memory
2 Serial, 1 Parallel, 1 Game
101-key keyboard
Serial Mouse
Mid Tower Case with 230W

486DX-50 $1465

Intel 80486DX-50 CPU
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Teac 1.2MB Floppy Drive
Teac 1.44MB Floppy Drive
14" ***CTX Non-Interlace***
Monitor (1024 x 768, .28mm)
SVGA Card w/1MB Memory
2 Serial, 1 Parallel, 1 Game
101-key keyboard
Serial Mouse
Mid Tower Case with 230W

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128K Cache Memory
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Teac 1.2MB Floppy Drive
Teac 1.44MB Floppy Drive
14" ***SVGA*** Monitor
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SVGA Card w/1MB Memory
2 Serial, 1 Parallel, 1 Game
101-key keyboard
Serial Mouse
Mini Tower Case with 230W

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CTX 1461	$35.00
CTX 15"	$140.00
CTX 17"	$535.00
Graphic Cards:	
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Steath 24 VLB	$100.00

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One Year Parts Warranty

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Orchid Local Bus

VESA Standard (Bus Master)

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486DX-50	$1365.00
486DX-33	$1185.00

- ✧ Orchid 486DX VESA Local Bus M/B
- ✧ 256K High Speed Cache
- ✧ 4MB Memory on board expandable up to 32MB
- ✧ TEAC 1.2M & 1.44M FDD
- ✧ 32-Bit Orchid Fahrenheit VLB Graphics Accelerator w/1MB
- ✧ 32-Bit Orchid VLB IDE Controller
- ✧ 2 Serial/1 Parallel/1 Game
- ✧ CS-230 Mid-Veritcal Case
- ✧ 250 Watts UL Power Supply
- ✧ Enhanced 101 Keys Keyboard

Made in USA

VA Options + $40

New ORCHID Celsius/VLB
Faster than Ever - *out perform ATi VLB mach32*

The Orchid Celsius/VLB is a Windows accelerator for 486 personal computers that provides direct support for the VESA Local Bus (VL-Bus) standard. It combines a Graphical User Interface (GUI) accelerator for incredible speed, flicker-free 90Hz support, 16.8 million true colors, high resolution graphics (1280x1024x16 colors, non-interlaced) and full VESA compliance at an affordable price. In addition to the Windows drivers, the Celsius/VLB comes with high performance 32-bit AutoCAD Display List Drivers.

AIR VESA Local Bus

AIR 486DX2-66VLB	$1385
AIR 486DX-50VLB	$1310
AIR 486DX-33VLB	$1110

- * AIR 486DX VESA Local Bus M/B
- * 256K High Speed Cache
- * 3 VLB slots, P5 Socket for Future upgrade
- * 4MB Memory on board expandable up to 64MB
- * TEAC 1.2M & 1.44M FDD
- * Orchid Fahrenheit VLB w/1MB
- * 32-Bit VESA Local Bus IDE Controller
- * 2 Serial/1 Parallel/1 Game
- * Mid-Vertical Case
- * 230 Watts Power Supply
- * Enhanced 101 Keys Keyboard

Made in USA

AIR EISA VESA Local Bus

AIR EISA 486DX2-66VLB	$1655
AIR EISA 486DX-50VLB	$1575
AIR EISA 486DX-33VLB	$1405

- * AIR 486DX EISA VESA Local Bus M/B
- * 256K High Speed Cache
- * 8 EISA slots, 3 VESA Local Bus slots
- * 4MB Memory on board expandable up to 128MB
- * TEAC 1.2M & 1.44M FDD
- * Orchid Fahrenheit VLB w/1MB
- * 32-Bit DTC2290 EISA IDE Controller
- * 2 Serial/1 Parallel/1 Game
- * Mid-Vertical Case
- * 230 Watts Power Supply
- * Enhanced 101 Keys Keyboard

Made in USA

NoteBook *(Black Series)*

386SXL-25	$1270
386DX-33	$1360
486SLC-25	$1415
486DX-33	$1745
486DX-33 Color	$2490

- * 9.5" High contrast MonoVGA CCFT backlight display, 64 gray scale, 8.5" Passive matrix Color VGA LCD display for color model
- * 1 Parallel, 1 Serial, External keyboard connector, External CRT connector, 1 Bus expansion pack connector (for modem, network, etc.), 2 Battery packs included
- * One 3.5" 1.44MB internal FDD
- * 80MB HDD (120MB & 200MB available)
- * Upgrade to 120MB HDD +$100.00
- * Upgrade to 200MB HDD +$270.00
- * 2MB for 386SXL-25, 4MB for 386DX-33, 486SLC-25, 486DX-33 & 486DX-33Color
- * Autoswitching AC adapter, Carrying case

Made in USA

VEGA VESA Local Bus

VEGA 486DX2-66VLB	$1355
VEGA 486DX-50VLB	$1280
VEGA 486DX-40VLB	$1145
VEGA 486DX-33VLB	$1110

- * VEGA 486DX VESA Local Bus M/B
- * 256K High Speed Cache
- * P5 Socket for Future upgrade
- * 4MB Memory on board expandable up to 64MB
- * TEAC 1.2M & 1.44M FDD
- * Orchid Fahrenheit VLB w/1MB
- * 32-Bit VESA Local Bus IDE Controller
- * 2 Serial/1 Parallel/1 Game
- * Mid-Vertical Case
- * 230 Watts Power Supply
- * Enhanced 101 Keys Keyboard

VEGA EISA Bus

VEGA EISA 486DX2-66VE	$1610
VEGA EISA 486DX-50VE	$1535
VEGA EISA 486DX-33VE	$1370

- * VEGA 486DX EISA M/B
- * 256K High Speed Cache
- * 4MB Memory on board expandable up to 128MB
- * TEAC 1.2M & 1.44M FDD
- * 32-Bit Orchid IIs-E 1MB EISA VGA Card
- * 32-Bit DTC2290 EISA IDE Controller
- * 2 Serial/1 Parallel/1 Game
- * Mid-Vertical Case
- * 230 Watts Power Supply
- * Enhanced 101 Keys Keyboard

VEGA ISA Bus

486DX2-66V	$1165
486DX-50V	$1090
486DX2-50V	$1000
486DX-40V	$925
486DX-33V	$890
486SX-33V	$790
486SX-25V	$700
386DX-40V	$630
386DX-33V	$640

- * VEGA 3486DX ISA M/B
- * 256K Cache for DX2-66/DX-50
- * 64K Cache for DX2-50/DX-33/SX-25/DX-40
- * 4MB Memory on board expandable to 32MB
- * TEAC 1.2M & 1.44M FDD
- * 2 Serial/1 Parallel/1 Game
- * Mid-Vertical Case
- * 230 Watts Power Supply
- * Enhanced 101 Keys Keyboard

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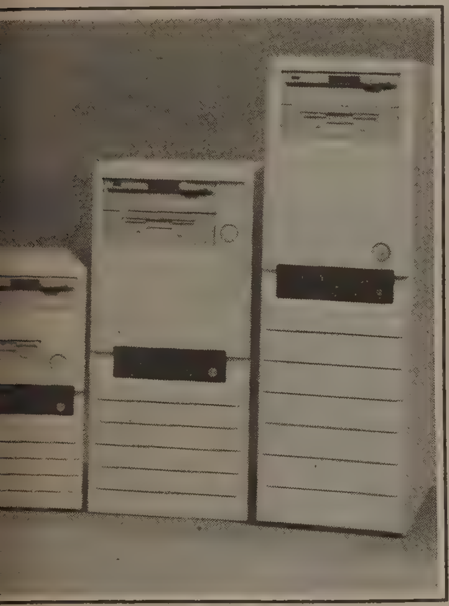


Essence 486 VESA EISA Local Bus

VESA 486DX2-66HLB	$1310
VESA 486DX-33HLB	$1070

- HINT 486DX EISA Local Bus M/B
- P24T socket for future P5 upgrade
- 256K High Speed Cache
- 3 EISA Bus, 2 VESA Local Bus
- 4MB Memory on board expandable up to 32MB
- TEAC 1.2M & 1.44M FDD
- 32-Bit VESA Local Bus IDE Controller
- 32-Bit 1MB VESA Local Bus VGA Card
- 2 Serial / 1 Parallel / 1 Game
- Mid-Vertical Case
- 230 Watts Power Supply
- Enhanced 101 Keys Keyboard

Essence 486 VESA Local Bus

VESA 486DX2-66LB	$1205
VESA 486DX-50LB	$1140
VESA 486DX-40LB	$990
VESA 486DX-33LB	$955

- VESA Local Bus 486DX M/B
- 256K High Speed Cache
- 4MB Memory on board expandable up to 32MB
- TEAC 1.2M & 1.44M FDD
- 32-Bit VESA Local Bus IDE Controller
- 32-Bit 1MB VESA Local Bus VGA Card
- 2 Serial / 1 Parallel / 1 Game
- Mini-Vertical Case
- 200 Watts Power Supply
- Enhanced 101 Keys Keyboard

Essence 486 Series

486DX2-66	$1075
486DX-50	$1005
486DX2-50	$925
486DX-40	$845
486DX-33	$810
486SX-33	$715
486SX-25	$625

- 486DX/SX M/B
- 256K Cache for DX2-66/DX-50
- 128K Cache for DX2-50/DX-40/DX-33/SX-33/SX-25
- 4MB Memory on board
- TEAC 1.2M & 1.44M FDD
- IDE FDD & HDD Controller
- 2 Serial / 1 Parallel / 1 Game
- Mini-Vertical Case
- 200 Watts Power Supply
- Enhanced 101 Keys Keyboard

Essence 386 Series

386DX-40	$515
386SX-40	$395
386SX-33	$375

- 386DX-40/33 SX-40/35 M/B
- 128K High Speed Cache (0K for SX-40 & SX-33)
- 4MB Memory on board (2MB for 386SX)
- TEAC 1.2M & 1.44M FDD
- IDE FDD & HDD Controller
- 2 Serial / 1 Parallel / 1 Game
- Mini-Vertical Case
- 200 Watts Power Supply
- Enhanced 101 Keys Keyboard

Essence 486DLC

486DLC-40	$680
486DLC-33	$615

- 486DLC M/B
- Cyrix 486DLC Microprocessor
- Math Coprocessor included
- 128K High Speed Cache
- 4MB Memory on board
- TEAC 1.2M & 1.44M FDD
- IDE FDD & HDD Controller
- 2 Serial / 1 Parallel / 1 Game
- Mini-Vertical Case
- 200 Watts Power Supply
- Enhanced 101 Keys Keyboard

Upgrade Options

For ISA Systems:

14" Infiniti IN8339SV Super VGA Monitor (.39dp) w/AVGA-3 1MB VGA Card	$280
14" Infiniti IN8828SV Super VGA Monitor (.28dp) w/AVGA-3 1MB VGA Card	$310
14" Infiniti IN8828N4 Non-Interlaced Monitor (.28dp) w/AVGA-3 1MB VGA Card	$365
14" AcerView 11 VGA Color Monitor (.39dp) w/16-bit VGA-1 Card (256K)	$245
14" AcerView 33D Super VGA Color Monitor (.28dp) w/AVGA-3 1MB VGA Card	$330
14" AcerView 34T Non-Interlaced Color Monitor (.28dp) w/AVGA-3 1MB VGA Card	$360
15" AcerView 56L Digital Auto-Tracking Flat-Screen Monitor w/Orchid Fahrenheit 1MB Graphics Accelerator	$620
14" CTX-5468A Super VGA Monitor (.28dp) w/AVGA-3 1MB VGA Card	$320
14" CTX-5468NI Non-Interlaced Color Monitor (.28dp) w/AVGA-3 1MB VGA Card	$345
14" CTX-1461 Digital Auto-Tracking Monitor (.28dp) w/AVGA-3 1MB VGA Card	$370
15" CTX-1560 Digital Auto-Tracking Monitor (.28dp) w/Orchid Fahrenheit 1MB Graphics Accelerator	$690
17" CTX-1760 Digital Auto-Tracking Monitor (.28dp) w/Orchid Fahrenheit 1MB Graphics Accelerator	$940
14" ViewSonic 6E Non-Interlaced Color Monitor (.28dp) w/AVGA-3 1MB VGA Card	$375
14" ViewSonic 5E Non-Interlaced Color Monitor (.28dp) w/AVGA-3 1MB VGA Card	$440
15" ViewSonic 6FS Digital Auto-Tracking Flat-Screen Monitor w/Orchid Fahrenheit 1MB Graphics Accelerator	$675
17" ViewSonic 7 Digital Auto-Tracking Monitor (.28dp) w/Orchid Fahrenheit 1MB Graphics Accelerator	$1050

Hard Disk Subsystem & Other Options (w/Systems):

40MB IDE HDD	$134
80MB IDE HDD	$180
120MB IDE HDD	$202
170MB IDE HDD	$228
200MB IDE HDD	$241
240MB IDE HDD	$280
340MB IDE HDD	$350
520MB IDE HDD	$760
Tekram DC-600 IDE Caching Controller w/2MB	$190
MicroSoft DOS 6.0	$45
MicroSoft Windows 3.1 w/Mouse	$58
Internal 2400 Buad Data Modem	$30
Internal 9600/2400 Baud Fax Modem	$55
Internal 14400/14400 Baud Fax Modem	$185
Mitsumi CRMC Intrernal CD-ROM	$195
Sony CDU-31A Internal CD-ROM	$235
Sound Blaster Pro	$135
Media-Vision Pro Audio Spectrum 16 SoundCard	$155
Orchid Sound Producer Pro w/Speaker & Mic	$145
PowerCenter (UL)	$16
Mitac Multimedia Starter Kit	$390

-Mitsumi CRMC Internal CD-ROM (350ms)
-Sound Blaster Pro compatible sound card
-5 CD Titles: Compton's Multimedia Encyclopedia for Windows, The KGB/CIA World Fact Book, Dictionary of the Living World, Grammy Awards, & CD-ROM Software Jukebox
-and a pair of speakers

For EISA & Local Bus Systems:

ViewSonic 6E 14" Non-Interlaced Monitor	$318
ViewSonic 5E 14" Non-Interlaced Monitor	$380
ViewSonic 6FS 15" Digital Non-Interlaced Monitor	$515
ViewSonic 7 17" Digital Multi-Frequency Monitor	$883
ViewSonic 8 20" Digital Multi-Frequency Monitor	$1557
AcerView 34T 14" Non-Interlaced Monitor	$303
AcerView 56L 15" Digital Non-Interlaced Monitor	$460
AcerView 76i 17" Digital Non-Interlaced Monitor	$880
CTX-1461 14" Non-Interlaced Monitor	$315
CTX-1560 15" Digital Non-Interlaced Monitor	$430
CTX-1760 17" Digital Non-Interlaced Monitor	$780
MAG 1564 15" Digital Non-Interlaced Monitor	$440
MAG 15H 15" Digital Non-Interlaced Monitor	$550
MAG 17H 17" Digital Non-Interlaced Monitor	$985
Optiquest 1500D 14" Digital Non-Interlaced Monitor	$370
Optiquest 2000DX 15" Digital NI Monitor	$445
Optiquest 4000DX 17" Digital NI Monitor	$679

Memory Upgrade:

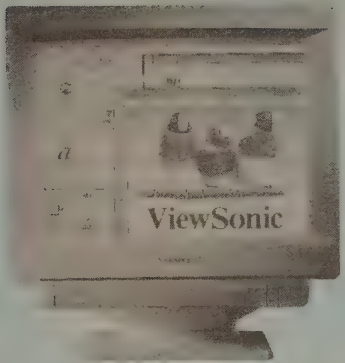
4MB (386SX) from 2MB	$80
8MB (486DX/SX, 386DX) from 4MB	$160
16MB (486DX/SX, 386DX) from 8MB	$450

Tape Backup:

Archive 9250i 250MB Tape Backup	$185
Colorado DJ-10 120MB Tape Backup	$155
Colorado DJ-20 250MB Tape Backup	$205
Colorado JT-10 120MB Parallel Tape Backup	$310
Colorado JT-20 250MB Parallel Tape Backup	$415

For more parts see listings on next page

cal Support: 714/546-7902



ViewSonic 15

The award-winning family of ViewSonic monitors now includes the New Generation ViewSonic 15. It features **ViewMatch** color control along with exceptional clarity and brilliance. And, with the ultra high **76Hz refresh rate at 1024x768**, the multifrequency monitor provides the user with a complete flicker free image.

With its larger flat square screen, the monitor offers a beautiful display with a full edge-to-edge crisp, glare-free image. The new ergonomically designed drop-down control panel makes it extremely easy to adjust size, position, color and pin-cushioning.

In keeping with today's concern for a safer environment, the ViewSonic 15 meets strict Swedish MPR-II low radiation standards. And, for home use, it is FCC Class B approved.

$550

Star Moon Star WILD Multi-Media Upgrade Kit

Upgrade Kit included:

SONY CDU-31A CD-ROM

- The lastest CD-ROM from SONY, 680MB capacity, 64KB buffer size, 150KB data transfer rate, 490ms access speed, built-in caddy for ease of use

Sun Moon Star Stereo Sound Board

- MPC, Ad Lib, and Sound Blaster Pro Basic compatible
- Stereo Digital/Analog mixer for stereo audio sources: DAC, FM, microphone, line-in and CD
- Sampling with 8-bit stereo DACs and ADCs selectable sampling rates: 4 - 44.1 KHz
- 20-voice, 4-operator OLP3 FM synthesier
- Built-in MIDI interface for music and sound creation
- Standard PC joystick port
- Microphone Automatic Gain Control (AGC) amplifier
- Output power amplifier with volume control
- Built-in interfacefor SONY CDU-31A

Bundled Multimedia CD titles including:

- Multimedia Encyclopedia '92
- World Atlas
- U.S. Altas
- Chessmaster 3000
- Mavis Beacon Teaches Typing V.20

$415

Toshiba 3401B Internal CD-ROM

- MPC compliant
- 682MB Capacity
- 200ms access time
- Multi-Session Kodak Photo-CD compliant
- 376KB data transfer rate
- comes with 16-bit interface cards & cable

$495

MULTIMEDIA SYSTEMS

Sun Moon Star Multimedia Upgrade Kit $415.00
- SONY CDU-31A Internal CD-ROM Drive - 490ms
- Sun Moon Star stereo sound board with sound utilities and bulti-in CDU-31A interface, Sound blaster Pro Basic compatible
- 5 leading multimedia CD titles - Multimedia Encyclopedia '92, World Atlas, U.S. Atlas, Chessmaster 3000 and Beacon's Typing Program
- A pair of Mini Speakers

Mitac Multimedia Upgrade Kit $395.00
- Mitsumi Internal CRMC CD-ROM (350ms, Kodak Photo CD compatible)
- Sound Galaxy NX Pro Sound Card
- Shielded Stereo Computer Speakers
- Software bundled: Compton's Multimedia Encyclopedia for Windows, The KGB/CIA World Factbook, Dictionary of the Living World, Grammy Awards, CD-ROM Software Jukebox

Creative Labs Discovery CD 8 Upgrade Kit (Internal) $405.00
- **Sound Blaster Pro** Stereo Sound Card
- Creative Labs Internal CD-ROM (Panasonics CD-ROM), 64KB Buffer, 150KB/sec Data Transfer, 390ms Access rate, Photo CD compatible
- A pair of Stereo Speakers
- Software bundled: Multimedia Encyclopedia, The Animals!, Lemmings

Creative Labs Discovery CD 16 Upgrade Kit (Internal) $465.00
- **Sound Blaster 16** Stereo Sound Card
- Creative Labs Internal CD-ROM (Panasonics CD-ROM), 64KB Buffer, 150KB/sec Data Transfer, 390ms Access rate, Photo CD compatible
- A pairs of Stereo Speakers
- Software bundled: Multimedia Encyclopedia, The Animals!, Lemmings

Creative Labs Edusterment CD 8 Upgrade Kit (Internal) $465.00
- **Sound Blaster Pro** Stereo Sound Card
- Creative Labs Internal CD-ROM (Panasonics CD-ROM), 64KB Buffer, 150KB/sec Data Transfer, 390ms Access rate, Photo CD compatible
- A pairs of Stereo Speakers
- Software bundled: The San Diego Zoo Presents ... The Animals!, Where in the World is Carmen Diego?, Multimedia Enclopedia, Just Grandma and Me, The Secret of Monkey Island, Loom, Secret Weapons of the Luftwaffe, Sherlock Holmes - Consulting Detective

Creative Labs Edusterment CD 16 Upgrade Kit (Internal) $525.00
- **Sound Blaster 16** Stereo Sound Card
- Creative Labs Internal CD-ROM (Panasonics CD-ROM), 64KB Buffer, 150KB/sec Data Transfer, 390ms Access rate, Photo CD compatible
- A pairs of Stereo Speakers
- Software bundled: The San Diego Zoo Presents ... The Animals!, Where in the World is Carmen Diego?, Multimedia Enclopedia, Just Grandma and Me, The Secret of Monkey Island, Loom, Secret Weapons of the Luftwaffe, Sherlock Holmes - Consulting Detective

Media Vision Fusion CD 16 (Internal) $495.00
- SONY CDU-31A Internal CD-ROM Drive - 490ms
- Media Vision Pro Audio 16 Stereo Sound Card
- High-quality Labtec Amplified Speaker System
- Software bundled: Carmen San Diego, Compton's New Media, Wing Commander II, Ultima Underworld

Media Vision Fusion CD 16 (eXternal) $475.00
- NEC External CD-ROM Drive
- Media Vision Pro Audio 16 Stereo Sound Card
- High-quality Labtec Amplified Speaker System
- Software bundled: Carmen San Diego, Compton's New Media, Wing Commander II, Ultima Underworld

Media Vision Pro-16 Multimedia System $895.00
- NEC CDR-84 Internal SCSI CD-ROM (Multi-Session, 280ms)
- Media Vision Pro Audio Spectrum 16 Stereo Sound Card
- Software bundled: Carmen San Diego, Compton's Encyclopedia, Lotus 1-2-3, King's Quest V, Nautilus CD, and MacroMind Action! CD

Media Resource Pro-16 Multimedia System $615.00
- Toshiba 3401B Internal SCSI CD-ROM (Multi-Session, 200ms)
- Media Vision Pro Audio Spectrum 16 Stereo Sound Card
- A pair of Speakers

Media Resource Digital Multimedia System $715.00
- Toshiba 3401B Internal SCSI CD-ROM (Multi-Session, 200ms)
- Media Master Digital 16 Stereo Sound Card
- A pair of Stereo Digital Sound Speakers

CD-ROMS

Mitsumi CRMC Internal CD-ROM w/Interface (350ms)	$198.00
NEC CDR-74-1 External SCSI CD-ROM (280ms)	$625.00
NEC CDR-84-1 Internal SCSI CD-ROM (280ms)	$550.00
Panasonic CR-522-B Internal CD-ROM w/Interface	$235.00
SONY CDU-31A Internal CD-ROM w/Interface	$235.00
SONY CDU-31A External CD-ROM w/Interface	$295.00
SONY CDU-541 Internal SCSI CD-ROM	$440.00
Texel DM3204 Internal SCSI CD-ROM w/Interface	$430.00
Toshiba 3401B Internal SCSI CD-ROM	$450.00
Toshiba 3401B Internal SCSI CD-ROM w/Interface	$495.00
- Fully integrated Audio, Double-speed, MPC compliant, Multi-Session Kodak Photo CD compliant, SCSI-2	

Creative Lab Sound Blaster Deluxe	$85.00
Creative Lab Sound Blaster Pro Deluxe	$138.00
Creative Lab Sound Blaster 16 ASP	$240.00
Creative Lab Video Blaster w/Microsoft video for Win	$355.00
Media Vision Pro Audio Spectrum 16 Sound Card	$180.00
Media Vision Pro Audio Studio 16 Sound Card	$240.00
Orchid Sound Producer Pro w/Mic & Speaker	$149.00
Sound Blaster Pro w/SONY-31A CD-ROM Interface	$120.00
Sound Commander Pro CD Bundle Package	$135.00
- w/SONY-31A CD-ROM Interface & Speakers	
- Bundled SW: CD Studio, Karaoke Software, PC Organ, Windows Driver & Audio Mixer	
Sun Moon Star Multimedia Sound Set	
- w/Sound Blaster Pro Sound Card w/SONY-31A CD-ROM Interface	
- Bundled Software: Mario is Missing, & D/Generation	

SPEAKERS & ACCESSORIES

Labtec AM-22 Deluxe Microphone	$13.95
Labtec C-10 Computer Stereo Headphone	$14.95
Labtec CS-150 Shielded Amplified Stereo Speakers	$19.50
Labtec CS-550 Shielded Amplified Stereo Speakers w/Built-in Power Boosters	$27.50
Labtec SS-700 Shielded Amplified Stereo Speakers w/3 Band EQ	$32.50
Labtec SS-1000 Shielded Amplified Stereo Speakers	$95.00
Labtec AD-4 400mA AC Adapter (for Speakers System)	$9.95
Zoltrix ZX-55 Mini Speakers	$9.95
Zotlrix ZX-28 Shielded Amplified Stereo Speakers w/3Band EQ	$27.95

CD TITLES

CD Pak for DOS	$92.00
- 6 Titles: Multimedia Encyclopedia, The Animals!, Reference Library, US Atlas, World Altas, & The Secret of Monkey Island	
CD Pak for Windows	$92.00
- 6 Titles: Multimedia Encyclopedia, The Animals!, Chessmaster 3000, US Atlas, World Atlas, & Beacon Teaches Typing 2.0	
CD Pak for Home	$72.00
- 5 Titles: Tempra Access Photo CD, The Animals!, US Atals, World Atlas, & Mayo Clinic	
CD Pak for Entertainment	$72.00
- 5 Titles: Mario is Missing, D/Generation, Chessmaster 3000, Wind Commander / Ultima VI, & The Secret of Monkey Island	
CD Quartet 1	$38.00
- US Atlas, World Atlas, Chessmaster 3000, Mavis Beacon Teaches Typing	
CD Quartet 2	$43.00
- US Atlas, World Atlas, Reference Labrary, Secret of Monkey Island	

BUSSINESS

American Bus Phone Book - 1992 (DOS)	$27.00
Authorware Star (MPC)	$52.00
Business & Economy Atlas (DOS)	$29.00
Kodak Photo CD (MPC)	$25.00
Lotus 1-2-3 V3.1 (MPC)	$89.00
Macromind Action (MPC)	$36.00
Marketing Master 1992 (DOS)	$28.00
Microsoft Works (MPC)	$50.00
Publish It 2.0 (DOS)	$27.00
TEMPRA Access Photo CD Imaging Software (DOS)	$24.00

EDUCATION

Animals! (MPC)	$24.00
Annabel's Dreams (MPC)	$85.00
Arthur's Teacher Trouble (MPC)	$32.00
Audubon's Mammals (DOS)	$31.00
Audubon's Birds (DOS)	$31.00
Barron's College Guide (MPC)	$29.00
Bring the World to Your Senses (DOS)	$19.00
Carmen San Diego (DOS)	$30.00
Choose your College	$21.00
Collection of PC Graphics (DOS)	$22.00
Composer Quest (MPC)	$34.00
Compton's Encyclopedia (MPC)	$64.00
Corp Snapshot (DOS)	$36.00
Dictionary of the Living World (MPC)	$34.00
Dinosaur Adventure (MPC)	$32.00
DTP Pro FM - Wave Clipart	$26.00
Electronic Home Library (DOS)	$30.00
Family Choice / Britannica (DOS)	$27.00
Family Doctor (DOS/MAC)	$27.00
Family Education Collections (DOS)	$28.00
Great Cities - Vol. 1 (DOS)	$28.00
Great Cities - Vol. 2 (DOS)	$28.00
Jets & Props - Aris (MPC)	$28.00
Language of the World for Windows (MPC)	$40.00
Library of Future 1st (DOS)	$51.00
MacMillan Dictionary for Children (MPC)	$34.00
Mavis Beacon Teaches Typing (MPC)	$27.00
Media Clips - Jets,Props,View,Place (MPC)	$46.00
Microsoft BookShelf (MPC)	$50.00
National Geographic Mammals (DOS)	$31.00
National Parks (DOS)	$23.00
Ocean Digital Imagery V1 (DOS)	$40.00
Playing Language - English (DOS)	$30.00
Playing Language - French (DOS)	$30.00
Playing Language - Germany (DOS)	$30.00
Playing Language - Japanese (DOS)	$30.00
Playing Language - Spanish (DOS)	$30.00
Presidents (DOS)	$78.00
Renaissance Master I (MPC)	$34.00
Renaissance Master II (MPC)	$34.00
Illustrated Works of Shakespeare	$23.00
Sleeping Beauty (MPC)	$25.00
Sound Library (MPC)	$21.00
Survey of Western Arts (MPC)	$34.00
TIME Almanac - 1991 (DOS)	$32.00
Time Table of History (DOS)	$21.00
Toolworks Multimedia Encyclopedia (MPC)	$57.00
Toolworks Reference Library (DOS)	$25.00
U.S. Atlas & Automap (DOS)	$28.00
Atlas Pak - US / World Atlas (DOS)	$23.00
U.S. Histroy (DOS)	$28.00
USA Wars: Civil War (DOS)	$46.00
USA Wars: Desert Storm (MPC)	$28.00
USA Wars: Korea (DOS)	$46.00
USA Wars: World Wae II (DOS)	$46.00
USA Wars: Vietnam (DOS)	$46.00
Vital Signs (MPC)	$85.00
Whale of Tale	$84.00
Wild Places (DOS)	$19.00
WinWare Vol 3	$27.00
World View (DOS)	$19.00

ENTERTAINMENT

Amanda Stories (MPC)	$53.00
Battle Chess (DOS)	$26.00
Beauty & Beast (MPC)	$22.00
Beyond the World of Stars (DOS)	$29.00
CD Game Pak II (DOS)	$30.00
CD Storytime (DOS)	$25.00
Chessmaster 3000 (MPC)	$23.00
CIA World Fact Book (DOS)	$27.00
Guinness Disc of Records 1993 (MPC)	$30.00
Guinness Disc of Records (DOS)	$19.00
Interactive Storytime Vol 1 (DOS)	$27.00
Jones in the Fast Lanes (MPC)	$25.00
King's Quest V (DOS)	$25.00
Loom from Lucas Film (DOS)	$25.00
Mantis Experimental Fighter (DOS)	$22.00
Mario is Missing / D/Generation (DOS)	$33.00
Mario Mission / World Atlas (DOS)	$30.00
Mayo Clinic Family Health Book (DOS)	$24.00
MIDI Music Shop (MPC)	$27.00
Mixed up Mother Goose (MPC)	$25.00
The Secret of Monkey Island (DOS)	$24.00
PC-SIG 11th Edition (DOS)	$23.00
Peter & the Wolf (MPC)	$22.00
Secret Weapons of Luftwaffe (DOS)	$25.00
Sherlock Holmes (DOS)	$25.00
So Much Sharewaew I (DOS)	$20.00
So Much Shareware II (DOS)	$25.00
Space Adventure (MPC)	$32.00
Space Quest IV	$25.00
Sport's Best (3 in 1) (DOS)	$26.00
Stellar 7 (DOS)	$25.00
Total Baseball (DOS)	$25.00

CD TITLES

Who Killed Sam Rupert (DOS/MPC)	$34.00
Willie Beamish - The Adventure (DOS)	$25.00
Wing Commader / Ultima VI (DOS)	$25.00
Wizard	$21.00

SYSTEM BOARDS (0K)

VESA Local Bus System Boards (w/CPU)

Orchid 486DX2-66MHz VESA Local Bus M/B w/256K Cache	$770.00
Orchid 486DX-50MHz VESA Local Bus M/B w/256K Cache	$703.00
Orchid 486DX-40MHz VESA Local Bus M/B w/256K Cache	$580.00
Orchid 486DX-33MHz VESA Local Bus M/B w/256K Cache	$545.00
AIR Baby 486DX2-66MHz VESA Local Bus M/B w/256K Cache	$760.00
AIR Baby 486DX-50MHz VESA Local Bus M/B w/256K Cache	$688.00
AIR Baby 486DX-33MHz VESA Local Bus M/B w/256K Cache	$540.00
VEGA Baby 486DX2-66MHz VESA Local Bus M/B w/256K Cache	$730.00
VEGA Baby 486DX-50MHz VESA Local Bus M/B w/256K Cache	$658.00
VEGA Baby 486DX-40MHz VESA Local Bus M/B w/256K Cache	$545.00
VEGA Baby 486DX-33MHz VESA Local Bus M/B w/256K Cache	$510.00
EFAR Baby 486DX2-66MHz VESA Local Bus M/B w/256K Cache	$685.00
EFAR Baby 486DX-40MHz VESA Local Bus M/B w/256K Cache	$500.00
EFAR Baby 486DX-33MHz VESA Local Bus M/B w/256K Cache	$465.00
OPTI Mini 486DX2-66MHz VESA Local Bus M/B w/256K Cache	$687.00
OPTI Mini 486DX-50MHz VESA Local Bus M/B w/256K Cache	$615.00
OPTI Mini 486DX-40MHz VESA Local Bus M/B w/256K Cache	$502.00
OPTI Mini 486DX-33MHz VESA Local Bus M/B w/256K Cache	$467.00
Hint Baby 486DX2-66MHz EISA VESA Local Bus M/B w/256K Cache	$742.00
Hint Baby 486DX-40MHz EISA VESA Local Bus M/B w/256K Cache	$557.00
Hint Baby 486DX-33MHz EISA VESA Local Bus M/B w/256K Cache	$522.00

VESA Local Bus Video Cards & Controllers:

ATi VLB mach 32 VESA Local Bus Graphics Accelerator w/2MB	$400.00
Cirrus Logic GD5426 1MB VESA Local Bus Graphics Accelerator	$100.00
Diamond SpeedStar Pro VESA Local Bus Graphics Accelerator w/1MB	$135.00
Diamond Stealth-24 VESA Local Bus Graphics Accelerator w/1MB	$175.00
Diamond Stealth Pro VESA Local Bus Graphics Accelerator w/1MB	$260.00
Diamond Viper VESA Local Bus Graphics Accelerator w/2MB VRAM	$400.00
Genoa 1MB VESA Local Bus Graphics Accelerator	$112.00
Oak 087 1MB VESA Local Bus Graphics Accelerator	$102.00
Orchid Fahrenheit VESA Local Bus Windows Accelerator w/1MB	$185.00
Orchid Celius VESA Local Bus Graphics Accelerator w/1MB	$240.00
Orchid P9000 VESA Local Bus Graphics Accelerator w/3MB	$350.00
Orchid IO440-0 VESA Local Bus IDE Controller w/Multi I/o	$66.00
Turbo VESA Local Bus IDE Controller w/Multi I/O	$68.00
VESA Local Bus IDE Controller with Multi I/O	$45.00
Tekram DC-680 VESA Local Bus IDE Caching Controller (up to 16MB)	$176.00
UltraStor 34F VESA Local Bus SCSI Controller (Bus Master)	$285.00

EISA Bus & EISA Local Bus System Boards (w/CPU)

AIR Baby 486DX2-66MHz EISA M/B w/256K Cache (USA made)	$945.00
AIR Baby 486DX-50MHz EISA M/B w/256K Cache (USA made)	$873.00
AIR Baby 486DX-33MHz EISA M/B w/256K Cache (USA made)	$725.00
VEGA Baby 486DX2-66MHz EISA M/B w/256K Cache (USA made)	$900.00
VEGA Baby 486DX-50MHz EISA M/B w/256K Cache (USA made)	$828.00
VEGA Baby 486DX-33MHz EISA M/B w/256K Cache (USA made)	$680.00
OPTI Baby 486DX2-66MHz EISA Local Bus M/B w/256K Cache	$750.00
OPTI Baby 486DX-50MHz EISA Local Bus M/B w/256K Cache	$688.00
OPTI Baby 486DX-33MHz EISA Local Bus M/B w/256K Cache	$530.00

ISA Bus System Boards (w/CPU)

VEGA Baby (3)486DX2-66MHz M/B w/256K Cache (USA made)	$725.00
VEGA Baby (3)486DX-50MHz M/B w/256K Cache (USA made)	$653.00
VEGA Baby (3)486DX2-50MHz M/B w/64K Cache (USA made)	$591.00
VEGA Baby (3)486DX-40MHz M/B w/64K Cache (USA made)	$515.00
VEGA Baby (3)486DX-33MHz M/B w/64K Cache (USA made)	$478.00
VEGA Baby (3)486DLC-40MHz M/B w/64K Cache (USA made)	$387.00
VEGA Baby (3)486DLC-33MHz M/B w/64K Cache (USA made)	$323.00
VEGA Baby (3)486SX-33MHz M/B w/64K Cache (USA made)	$380.00
VEGA Baby (3)486SX-25MHz M/B w/64K Cache (USA made)	$290.00
VEGA Baby 3(4)86DX-40MHz M/B w/64K Cache (USA made)	$223.00
OPTI Mini 486DX2-66MHz M/B w/256K Cache (Write-back cache)	$671.00
OPTI Mini 486DX-50MHz M/B w/256K Cache (Write-back cache)	$599.00
OPTI Mini 486DX2-50MHz M/B w/128K Cache (Write-back cache)	$541.00
OPTI Mini 486DX-40MHz M/B w/128K Cache (Write-back cache)	$465.00
OPTI Mini 486DX-33MHz M/B w/128K Cache (Write-back cache)	$428.00
OPTI Mini 486SX-33MHz M/B w/128K Cache (Write-back cache)	$330.00
OPTI Mini 486SX-25MHz M/B w/128K Cache (Write-back cache)	$240.00
Symphony Mini 486DX2-66MHz M/B w/256K Cache	$680.00
Symphony Mini 486DX-50MHz M/B w/256K Cache	$618.00
Symphony Mini 486DX2-50MHz M/B w/64K Cache	$551.00
Symphony Mini 486DX-40MHz M/B w/64K Cache	$475.00
Symphony Mini 486DX-33MHz M/B w/64K Cache	$438.00
Symphony Mini 486SX-33MHz M/B w/64K Cache	$340.00
Symphony Mini 486SX-25MHz M/B w/64K Cache	$250.00
PC Chip Mini 486SX-25MHz M/B (No Cache)	$210.00
OPTI Mini 486DLC-40MHz M/B w/128K Cache (w/Math Co)	$336.00
OPTI Mini 486DLC-33MHz M/B w/128K Cache (w/Math Co)	$272.00
OPTI Mini 386DX-40MHz M/B w/128K Cache (Write-back cache)	$167.00
UMC Mini 386DX-40MHz M/B w/128K Cache (Write-back cache)	$167.00
OPTI Mini 386DX-33MHz M/B w/128K Cache (AMD CPU)	$178.00
UMC Mini 386DX-33MHz M/B w/128K Cache (AMD CPU)	$178.00
**** 256K Cache upgrade from 64K for all 486 and 386 M/B*	*$45.00*
**** 256K Cache upgrade from 128K for all 486 and 386 M/B*	*$30.00*
OPTI Mini 386SX-40MHz MB w/16K Cache	$133.00
MX Mini 386SX-40MHz M/B	$120.00
OPTI Mini 386SX-33MHz M/B	$130.00
ALI Mini 386SX-33MHz M/B	$110.00
PC Mini 386SX-33MHz M/B	$100.00

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ADD-ON BOARDS

Mono/Graphics/Printer Card	$14.00
AVGA-1 VGA Card w/256K	$27.00
AVGA-3 (Cirrus Logic GD5420) 1MB Graphics Accelerator (32K color)	$55.00
AVGA-3 (Cirrus Logic GD5422) 1MB Graphics Accelerator (32K color)	$60.00
TVGA-9000 VGA Card w/256K (Trident 9000 Chipset,upto 512K)	$32.00
TVGA-8900CL 1MB SuperVGA Card (2x faster than Trident 8900C)	$58.00
PVGA-1C VGA Card w/256K (WD90C11 Chipset,upto 512K)	$46.00
PVGA-1DW Graphics Accelerator w/1MB & Hi-Color Chip	$94.00
ATi Graphics Ultra Plus (1280x1024, 2MB Dram)	$259.00
ATi Graphics Ultra Pro (1280x1024 Non-Interlaced, 2MB VRam)	$359.00
ATi Graphics Ultra Pro EISA w/2MB VRAM	$520.00
Diamond SpeedStar Pro Graphics Accelerator w/1MB	$132.00
Diamond Stealth-24 1MB Windows Accelerator (16Million colors)	$168.00
Diamond Stealth Pro Graphics Accelerator w/1MB VRAM	$255.00
Orchid Pro-Designer IIs 1MB VGA Card w/Sierra RAMDAC	$135.00
Orchid Pro-Designer IIs-E 1MB EISAVGA Card w/Sierra RAMDAC	$163.00
Orchid Fahrenheit Windows Accelerator (24-bit, 16.7Mil colors) w/1MB	$165.00
Orchid Fahrenheit-VA Windows Accelerator with Voice Annotation w/1MB - 24bit, 16.7Million colors, 1280x1024, Audio capabilities	$200.00
AT I/O (2 Serial 1 Parallel 1Game) Card	$14.00
High Speed AT I/O (2 Serial 1 Parallel) - compatiable 16C550	$40.00
Parallel (Printer) Card	$10.00
AT IDE Adapter (Dual floppy & hard disk) w/Cable	$15.00
AT Super IDE IO Adapter (Dual floppy & hard disk, 2S, 1P, 1G)	$18.00
GSI-11V 2.88M Four (4) Floppy Controller & Cable	$55.00
GSI-18V Co-resident IDE Controller (Works with ST412,ESDI,SCSI)	$42.00
GSI-21V 2.88M Four (4) Floppy & Intelligent IDE Adapter w/Cable	$62.00
Promise IDE Caching Controller (512K,upto 8.5MB,2FD/2HD)	$120.00
Tekram DC-600B ISA IDE Caching Controller (up to 16MB)	$125.00
Tekram DC-680 VESA Local Bus IDE Caching Controller (up to 16MB)	$176.00
DTC-2290 EISA IDE Floppy/Hard Disk Contorller	$121.00
DTC-3290 EISA SCSI Caching FD/HD Controller (0K,upto 4MB)	$435.00
DTC-3292 EISA SCSI FD/HD Controller	$325.00
UltraStor 14F SCSI FD/HD Controller	$210.00
UltraStor 24F EISA SCSI FD/HD Controller	$370.00
UltraStor 34F VESA Local Bus SCSI FD/HD Controller	$285.00
Future Domain 1670 16-bit SCSI Floppy/Hard Disk Adapter Kit	$157.00
Always IN-2000 16-bit SCSI Host Adapter (Novell Certified)	$189.00
ADAPTEC AHA-1522BK SCSI Adapter Kit	$157.00
ADAPTEC AHA-1542BK SCSI Bus Master Host Adapter Kit	$240.00
ADAPTEC AHA-1542CK SCSI Bus Master Host Adapter Kit	$260.00
ADAPTEC AHA-1542CK-Plus SCSI Bus Master Host Adapter Kit	$325.00
ADAPTEC AHA-1742AK EISA SCSI Bus Master Adapter Kit	$415.00

MONITORS

Tatung MM-14SAE 14" MonoVGA Monitor (1024x768)	$129.00
AcerView 11 14" VGA Monitor (640x480,.39dp)	$219.00
AcerView 33D 14" SuperVGA Color Monitor (1024x768,.28dp)	$273.00
AcerView 34T 14" Non-Interlaced Monitor (1024x768,.28dp)	$303.00
AcerView 35 14" SuperVGA Monitor (1024x768,.26dp)	$455.00
AcerView 56L 15" Digital Multi-Frequency Color Monitor (.28dp)	$460.00
AcerView 76i 17" Digital Multi-Frequency Color Monitor (.28dp)	$880.00
CTX5439A 14" SuperVGA Color Monitor (1024x768,.39dp)	$230.00
CTX5468A 14" SuperVGA (TriScan) Color Monitor (1024x768,.28dp)	$266.00
CTX5468NI 14" Non-Interlaced Color Monitor (1024x768,.28dp)	$290.00
CTX1461 14" Non-Interlaced Color Monitor (1024x768, 72Hz refresh)	$315.00
CTX1560 15" Digital Non-Interlaced Color Monitor (1024x768,.28dp)	$430.00
CTX1760 17" Digital Flat-Screen Color Monitor (1280x1024,.28dp)	$780.00
DigiView HR-1401 14" SuperVGA Color Monitor (1024x768,.39dp)	$212.00
DigiView HR-1428 14" SuperVGA Color Monitor (1024x768,.28dp)	$252.00
DigiView HR-1430ni 14" Non-Interlaced Monitor (1024x768,.28dp)	$275.00
Infiniti IN8339SV 14" SuperVGA Color Monitor (1024x768,.39dp)	$225.00
Infiniti IN8828SV 14" SuperVGA Color Monitor (1024x768,.28dp)	$258.00
Infiniti IN8828N4 14" Non-Interlaced Color Monitor (1280x1024,.28dp)	$300.00
Hitachi CM1584 15" Non-Interlaced Monitor (.28dp)	$454.00
MAG 1564 15" Color Monitor (1280x1024,.28dp)	$440.00
MAG MX-15H 15" Color Monitor (1280x1024,.28dp)	$550.00
MAG MX-17H 17" Color Monitor (1280x1024,.28dp)	$985.00
NEC 3FGe 15" Multi-Frequency Color Monitor (1024x768,.28dp)	$625.00
NEC 4FGe 15" Multi-Frequency Color Monitor (1024x768,.28dp)	$740.00
NEC 5FGe 17" Multi-Freuqency Color Monitor (1024x768,.28dp)	$1125.00
NEC MultiSync 5FG 21" Color Monitor (1280x1024,.28dp)	$1320.00
NEC MultiSync 6FG 21" Color Monitor (1280x1024,.28dp)	$2350.00
Optiquest 800S 14" VGA Color Monitor (640x480,.39dp)	$227.00
Optiquest 900S 14" SuperVGA Color Monitor (1024x768,.28dp)	$283.00
Optiquest 1000S 14" Non-Interlaced Color Monitor (1024x768,.28dp)	$308.00
Optiquest 1500D 14" Digital Non-Interlaced Monitor (1024x768,.28dp)	$371.00
Optiquest 2000DX 15" Digital Multi-Freq Monitor (1280x1024,.28dp)	$445.00
Optiquest 4000DX 17" Digital Multi-Freq Color Monitor (1024x768,.31dp)	$679.00
Optiquest 4000D 17' Digital Multi-Freq Color Monitor (1280x1024,.28dp)	$862.00
Sony CPD-1320 14" Non-Interlaced Monitor (640x480,.25dp)	$357.00
Sony CPD-1430 14" MultiScan Monitor (Non-Interlaced,.25dp)	$597.00
Sony CPD-1730 17" MultiScan Monstor (Non-Interlaced,.25dp)	$1043.00
Sony CPD-2036S 20" MultiScan Monitor (non-Interlaced,.30dp)	$1995.00
ViewSonic 4E 14" SuperVGA Color Monitor (1024x768,.28dp)	$294.00
ViewSonic 6 14" Non-Interlaced Color Monitor (1024x768,.28dp)	$330.00
ViewSonic 6E 14" Non-Interlaced Color Monitor (1024x768,.28dp)	$318.00
Viewsonic 5E 14" Non-Interlaced Color Monitor (1024x768,72Hz refresh)	$380.00
ViewSonic 6FS 15" Digital Multi-Frequency Color Monitor	$515.00
ViewSonic 7 17" Digital Multi-Frequency Color Monitor (.28dp)	$883.00
ViewSonic 8 20" Digital Multi-Frequency Color Monitor (.31dp)	$1557.00
ViewSonic 15 15" Digital Multi-Freq Color Monitor (.28dp,76Hz refresh)	$550.00
ViewSonic 17 17" Digital Multi-Freq Color Monitor (.28dp,1600x1280)	$1048.00
ViewSonic 20 20" Digital Multi-Freq Color Monitor (.28dp,1600x1280)	$1711.00
ViewSonic 21 21" Digital Multi-Freq Color Monitor (.28dp,1600x1280)	$1893.00

**** Please call for Hitachi, Mitsubishi, Radius, Seiko & SuperMac Monitors prices*

FLOPPY & HARD DRIVES

TEAC 1.2MB FDD (5.25")	$54.00
TEAC 1.44MB FDD (3.5") w/Mounting Kit	$48.00
TEAC 2-in-1 1.2/1.44MB FDD	$127.00
TEAC 2.88MB FDD (3.5") w/Mounting Kit	$87.00
Mitsumi 1.2MB FDD (5.25")	$52.00
Mitsumi 1.44MB FDD (3.5") w/Mounting Kit	$46.00
Conner CP-3000 40MB IDE HDD (28ms)	$149.00
Conner CP-30084E 85MB IDE HDD (17ms)	$180.00
Conner CP-30104 120MB IDE HDD (17ms)	$202.00
Conner CP-30174 170MB IDE HDD (17ms)	$228.00
Conner CP-30204 212MB IDE HDD (12ms,256K cache buffer)	$255.00
Conner CP-30254 250MB IDE HDD (14ms,64K cache buffer)	$286.00
Conner CP-30544 520MB IDE HDD (12ms,256K cache buffer)	$815.00
Conner CP-30080E 85MB SCSI HDD (17ms)	$198.00
Conner CP-30200 212MB SCSI-2 HDD	$327.00
Conner CP-30540 545MB Fast SCSI-2 HDD (12ms,256K cache buffer)	$860.00
Conner CP-385A SFT*STOR 85MB IDE Package	$244.00
Conner CP-3170A SFT*STOR 170MB IDE Package	$321.00

*Conner SFT*STOR Subsystem is pre-loaded with Windows 3.1, DOS 5.0, MS Works, Central Point Anti-Virus, also delivered with "co-resident host adapter and automated installation software.*

Fujitsu M2624T 520MB IDE HDD (12ms, 5yr warranty)	$760.00
Fujitsu M2624FA 520MB SCSI HDD (12ms, 5 yr warranty)	$765.00
Fujitsu M2266SA 1.2GB SCSI HDD (12ms, 5yr warranty)	$1100.00
Fujitsu M2652S 2.0GB SCSI HDD (12ms, 5yr warranty)	$2050.00
Fujitsu M2654S 2.4GB SCSI HDD (12ms, 5yr warranty)	$2310.00
Maxtor MX-7120A 120MB IDE HDD (15ms)	$212.00
Maxtor MX-7120S 120MB SCSI HDD (15ms)	$222.00
Maxtor MX-7170A 170MB IDE HDD (15ms)	$235.00
Maxtor MX-7213A 213MB IDE HDD (15ms)	$252.00
Maxtor MX-7213S 213MB SCSI HDD (15ms)	$307.00
Maxtor MX-7245A 245MB IDE HDD (15ms)	$278.00
Maxtor LXT-7345A 345MB IDE HDD (13ms)	$353.00
Maxtor LXT-340S 340MB SCSI HDD (13ms)	$560 00
Maxtor LXT-535A 520MB IDE HDD (13ms)	$879.00
Maxtor MX-540SL 540MB SCSI HDD (8.5ms)	$880.00
Maxtor MXT-1240S 1.2GB SCSI HDD (8.5ms)	$1335.00
Maxtor PO-12 1.2GB SCSI HDD (13ms)	$1036.00
Maxtor P1-17S 1.7GB SCSI HDD (13ms)	$1305.00
Quantum ProDrive ELS 85MB IDE HDD (17ms, 2yr warranty)	$192.00
Quantum ProDrive ELS127MB IDE HDD (17ms, 2yr warranty)	$225.00
Quantum ProDrive ELS 170MB IDE HDD (17ms, 2yr warranty)	$238.00
Quantum ProDrive LP 240MB IDE HDD (15ms, 256K Cache)	$326.00
Quantum ProDrive ELS 85MB SCSI HDD	$194.00
Quantum ProDrive ELS 127MB SCSI HDD	$227.00
Quantum ProDrive ELS 170MB SCSI HDD	$243.00
Quantum ProDrive LP 240MB SCSI HDD	$331.00
Quantum ProDrive 525MB SCSI HDD	$867.00
Quantum ProDrive 700MB SCSI HDD	$1100.00
Quantum ProDrive 1225MB (1.2GB) SCSI HDD	$1336.00
Toshiba MK-438FB 877MB SCSI-2 HDD (12.5ms)	$1041.00
Toshiba MK-538FB 1.2GB SCSI-2 HDD (12.5ms)	$1175.00
Western Digital AC2200 209MB IDE HDD (13ms)	$241.00
Western Digital AC2250 250MB IDE HDD (13ms)	$288.00
Western Digital AC2340 340MB IDE HDD (13ms)	$350.00

**** Please call for Micropolis, Seagate, & Toshiba Hard Disk Drives prices*

SyQuest SQ555 44MB SCSI Removable Disk Drive	$295.00
SyQuest SQ5110 88MB SCSI Removable Disk Drive	$335.90
SyQuest SQ3105 105MB IDE Removable Disk Drive (3.5")	$485.00
SyQuest SQ400 44MB Cartridge	$75.00
SyQuest SQ800 88MB Cartridge	$108.00
SyQuest SQ310 105MB 3.5" Cartridge	$90.00
SyQuest SQ01 SCSI Adapter w/Software	$45.00
SyQuest External Kit	$95.00
Summit SE-120 120MB Tape Backup w/PC Tool Backup Software	$150.00
Summit SE-250 250MB Tape Backup w/PC Tool Backup Software	$205.00
Summit SE-305 305MB IDE Tape Backup w/SummitSafe Software	$260.00
Archive 9250i 250MB Tape Backup w/One Pre-formatted Cartridge	$182.00
Hi-Lite (Archive) California-250 250MB Tape Backup	$189.00
Hi-Hite (Archive) California 525 525MB SCSI Tape Backup	$525.00
Colorado Memory System JT-10 120MB Parallel Port Tape Backup	$315.00
Colorado Memory System JT-20 250MB Parallel Port Tape Backup	$418.00
Colorado Memory System DJ-10 120MB Tape Backup	$156.00
Colorado Memory System DJ-20 250MB Tape Backup	$209.00
Colorado Memory System AB-11 External Adapter Kit	$35.00
Colorado Memory System KE-09 External Drive Kit	$75.00
Colorado Memory System FC-10 500Kb/s-1Mb/s Adapter Kit	$85.00
Colorado Memory System TC-15 Data Compression Adapter Kit	$185.00
3M DC2120 120/250MB Mini Data Cartridge	$20.00
Sony QD2120 120/250MB Mini Data Cartridge	$18.00
Maxell DC-2120 120/250MB Mini Data Cartridge	$18.00

CHASSIS (CASES)

CS-20 Baby AT Case w/200W UL P.S. (3x5.25",2x3.5")	$83.00
CS-35 Mid Vertical Case w/230W UL P.S. (3x5.25",3x3.5",Digital)	$92.00
CS-36 Full Vertical Case w/230W UL P.S. (6x5.25",2HD,Digital)	$122.00
CS-300GTS Full Vertical Case w/300W UL P.S. (7x5.25", Double fan)	$175.00
CS-510 Baby AT Case w/200W P.S. (3x5.25",1x3.5")	$62.00
CS-740 Mini Vertical Case w/230W P.S. (2x5.25",3x3.5",Door,Digital)	$69.00
CS-760 Mid Vertical Case w/230W P.S. (3x5.25",3x3.5",Door,Digital)	$86.00
CS-780 Full Vertical Case w/230W UL P.S. (4x5.25",2HD,Door,Digital	$119.00
CS-931A Mini Vertical Case w/200W P.S. (2x5.25",3x3.5",Digital)	$54.00
CS-931B Mini Vertical Case w/230W P.S. (2x5.25",3x3.5",Digital)	$56.00
CS-932A Mini Vertical Case w/200W P.S (2x5.25",3x3.5")	$52.00
CS-932B Mini Vertical Case w/230W P.S. (2x5.25",3x3.5")	$54 00
CS-923 Mid Vertical Case w/230W P.S. (3x5.25",3x3.5",Digital)	$74.00
CS-912 Full Vertical Case w/230W UL P.S. (4x5.25",2HD,Digital)	$111.00

Diamond Series: (Black color model available +$3.00)

CS-130 Full Vertical Case w/250W UL P.S. (4x5.25",2HD,Digital)	$126.00
CS-230 Mid Vertical Case w/250W UL P.S. (4x5.25",2HD,Digital)	$110.00
CS-330 Mini Vertical Case w/220W UL P.S. (2x5.25",3x3.5",Digital)	$81.00
CS-530 Desktop Case w/250W UL.P.S. (2x5.25",2x3.5",2HD,Digital)	$86.00
CS-730 Baby AT Case w/220W UL P.S. (2x5.25",1x3.5,1HD,Digital)	$81.00
CS-830 Slim Line Case w/220W UL P.S. (1x5.25",1x3.5",1HD,Digital	$81.00
2nd Fan for Diamond Series cases (CS-130,CS-230,CS-530)	*$10.00*

PRINTERS

Canon BJ-10ex Bubble Jet Printer	$252.00
Canon BJ-200 Bubble Jet Printer	$330.00
Canon BJ-230 Bubble Jet Printer	$408.00
Citizen GSX-190 Printer (9pin/color option)	$159.00
Citizen 200GX Printer (9pin/213cps/80col/color option)	$145.00
Citizen GSX-230 Quiet Printer (24pin/270cps/color option)	$232.00
Citizen GSX-240 Quiet Printer (24pin/300cps/80col/color option)	$290.00
Citizen GSX-145 Printer (24pin/192cps/132col/color option)	$355.00
**** Color Kit for Citizen 200GX, GSX-230 or GSX-240*	*+43.00*
Epson Action Printer 2250 (9pin)	$120.00
Epson Action Printer 3250 (24pin)	$179.00
Epson FX-870 Printer (9pin)	$273.00
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Continued from page 70

troops; while hundreds of precious cargo planes had to be risked at low altitude to deliver them into battle.

The night of June 5, 1944, Allied airborne divisions dropped into Normandy before the D-Day invasion. Though scattered all over the map, they proved their worth. In September 1944, as the Nazi armies shattered in Normandy fell back toward Germany, three Allied airborne divisions were risked again in a bold plan—Operation Market Garden—to invade the occupied Netherlands. This would secure the crossings of the lower Rhine, opening an easy route into the North German Plain, and possibly ending the war before Christmas. The resulting battle, depicted in the film "A Bridge Too Far" was a disaster. The British paratroops assigned to take the vital bridge at Arnhem were cut off and wiped out.

Graphics and Animation: 9
Sound: N/A
User Interface: 8
Overall Value: 8

This battle has always been a challenge to game designers. The battlefield is a long, narrow corridor, and the action is broken up into three or four widely scattered fights over bridges. Three-Sixty has tackled this complex battle with a splendid implementation of their battalion-level "V for Victory" game system. Each hexagonal terrain cell represents one kilometer, and each turn represents about four hours of real time. There are seven scenarios, ranging from single-screen battles that can be played in an hour to a sprawling campaign game that can take sixty hours to finish. You can play either side against the computer or a human opponent.

The user interface is a textbook example of how to manage complexity in an attractive and efficient way. There is no way to make stuff like allocating supply tonnage and plotting artillery support "intuitive," but with some study and practice, this system makes it relatively easy to observe the action and command your troops.

The DOS version is installed from a single high-density 3.5" disk and takes up a little more than 5MB of hard disk space. The Macintosh version is installed from two 800K disks and includes both color and monochrome files, as well as separate application files for systems with and without a math coprocessor. You can Trash the files you don't need. On a 4MB PowerBook 100, I experienced occasional crashes, which is not surprising with the first release of such a complex program. On a fast MS-DOS system, the program had very good performance, thanks in part to Mike Traffanstead's assembly language routines and Rob Brannon's FastDraw graphics implementation. The lurid color startup screens and music are a major waste of disk space.

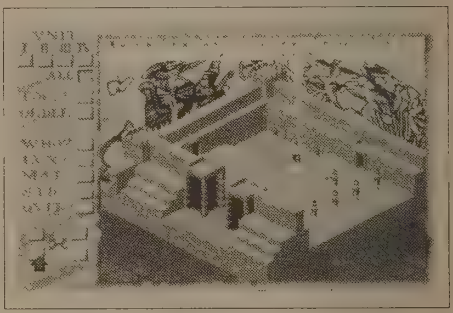
Documentation includes a basic 32-page user guide, a thick reference manual, an installation leaflet, and a poster-sized map with terrain details that came out rather muddy, which is, I suppose, meteorologically accurate for Holland in September. (Three-Sixty Pacific, Inc., 2105 South Bascom Ave., Campbell, CA 95008. 1-800-653-1360)

ROME: PATHWAY TO POWER

Designed By: Steve Grand and Ian Saunter
Published By: Maxis
For: MS-DOS (640K, VGA, supports mouse and popular audio cards)
List Price: $49.95

The time is August, 79 A.D. The place is Herculaneum, a seaside resort at the foot of Mt. Vesuvius. Your name is Hector, a slave in the household of a wealthy lawyer. Your assignment is to deliver a message across town. But if you want to avoid being engulfed in molten lava, you need to start planning your escape. If you survive this challenge and the conspiracies, battles, and disasters that follow, you can climb the social ladder—Citizen, Centurion, even Emperor.

The game alternates between animated sequences and an unusual scrolling "3-D" display (in isometric projection) that shows the buildings and people immediately around your character. You can zoom out to a Map view that shows the entire city or region. You perform actions by clicking on simple controls, such as Use... and Do..., which display the choices currently available. For example, when you interact with another character, typical options are Greet, Inquire, Threaten, and Pay. When you command legions in battle, the options include Advance, Retreat, Halt, Attack, Rest, and Rally. I found the interface rather awkward. On a fast computer like a '486, the real-time action seems to unfold too quickly, and there is no easy way to slow things down.



The design team is based in Cambridge, England, and a British sense of humor permeates the game. The historical setting

Continued on page 82

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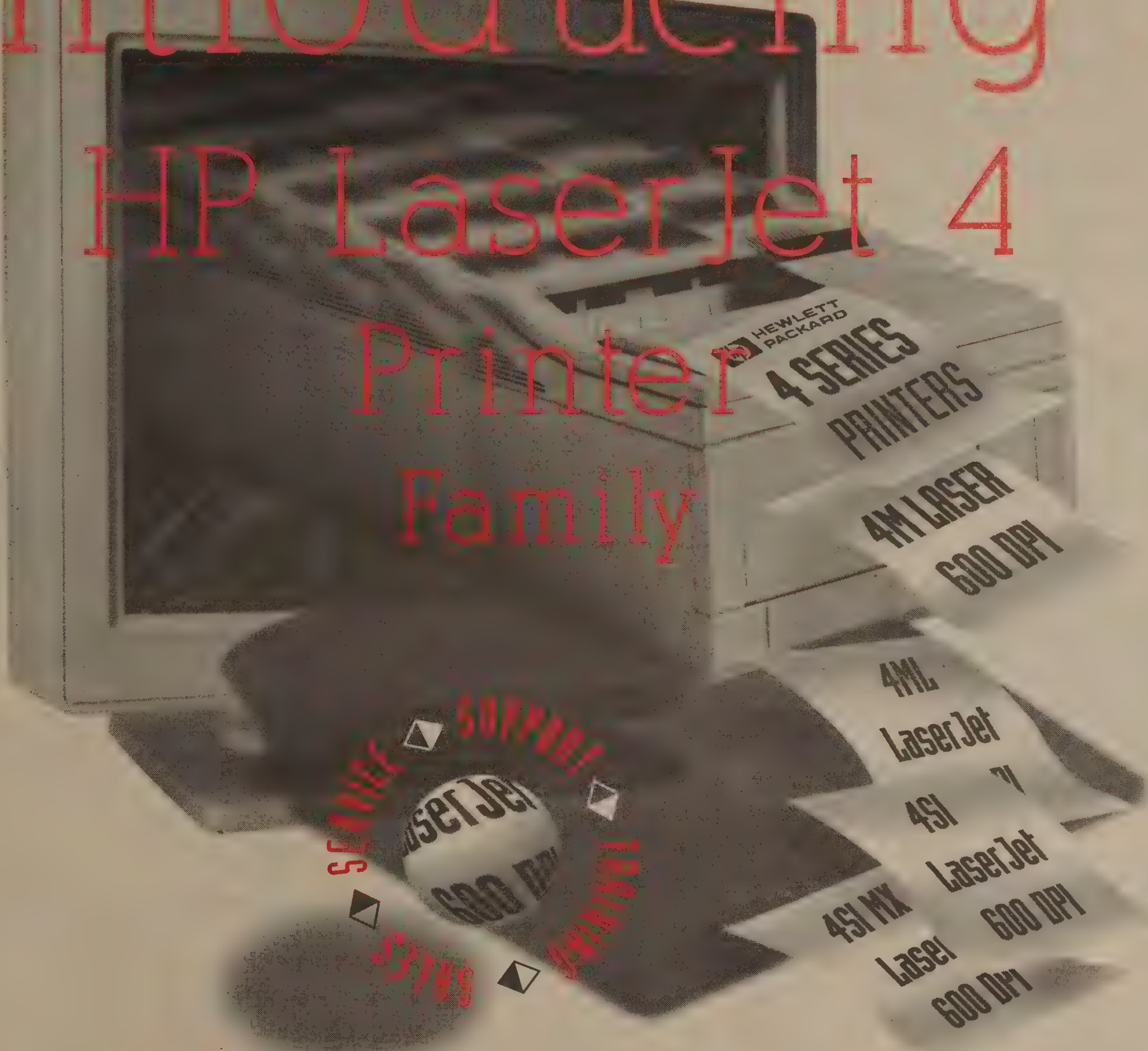
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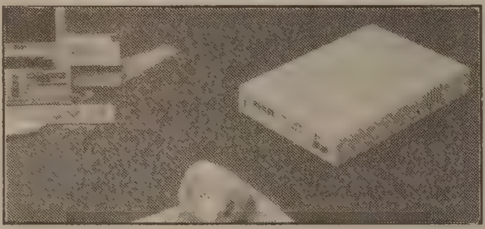

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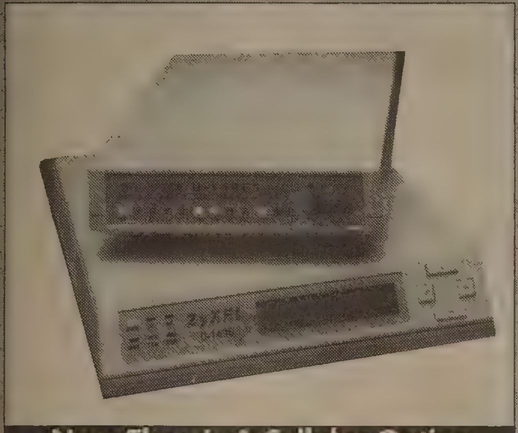

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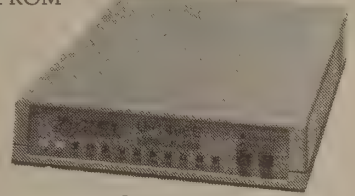

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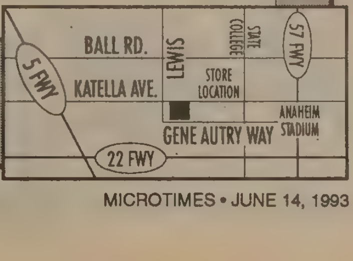

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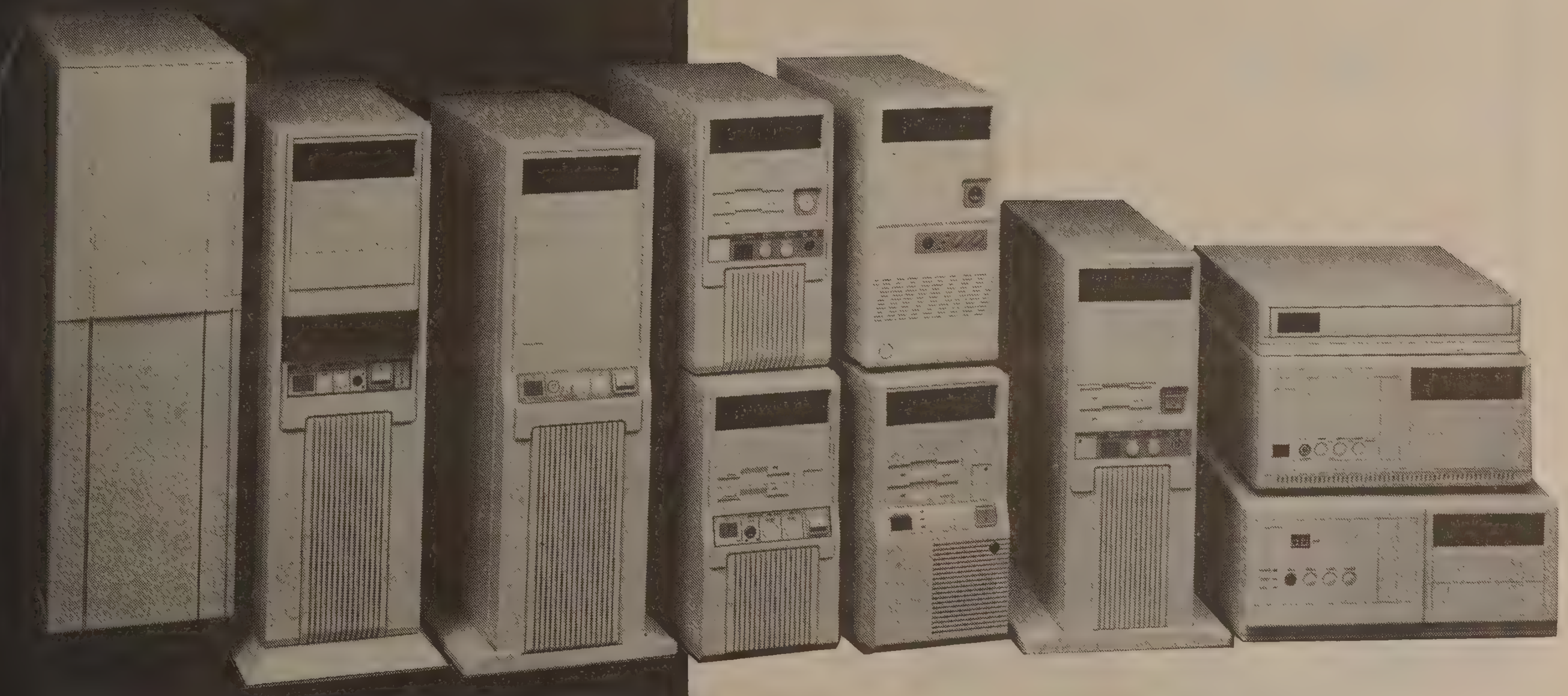

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Continued from page 76

and details seem quite authentic, however.

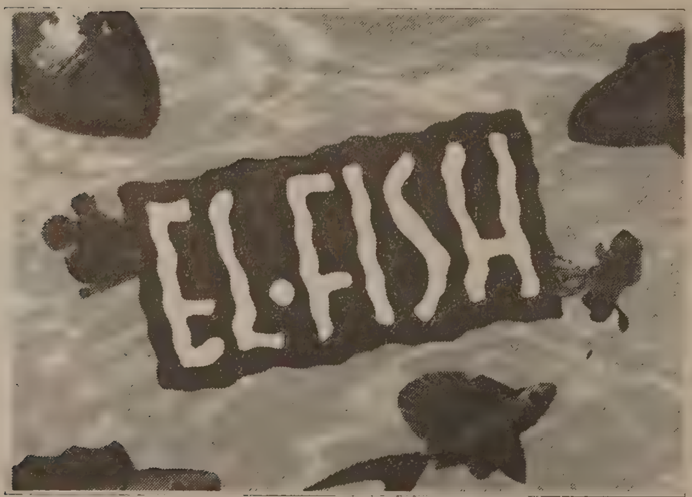
Rome: Pathway to Power is described as role-playing adventure of "intermediate difficulty." This means that a beginner can actually enjoy it without having to depend totally on the hint book. In a gesture of truly Imperial magnanimity, Maxis sends you the hint book free when you mail in the registration card.

Graphics and Animation: 9
Sound: 9
User Interface: 8
Overall Value: 9

The game is installed from compressed files on two high-density 5.25" or three 3.5" disks, and takes up almost 5MB of hard disk space, including fourteen subdirectories! The illustrated manual's LXXVI pages include instructions in English, Spanish, French, German, and Italian (but not Latin). (MAXIS, 2 Theatre Square, Suite 230, Orinda, CA 94563-3346. 510/254-9700, 1-800-336-2947)

EL-FISH: THE ELECTRONIC AQUARIUM

Designed By: Dr. V. Pokhilko, A. Pajitnov
Published By: Maxis
For: MS-DOS (4MB RAM, 386 or higher processor, VGA graphics, mouse, most audio cards supported, math coprocessor recommended)
List Price: $59.95



Freshwater fish generally wear nature's standard camouflage—dark above, light below. But the beautiful creatures we call "tropical fish" evolved in richly diverse ecosystems like the coral reef, where bright colors and extravagant shapes provided some competitive advantage as recognition features, or perhaps to confuse predators. For humans, watching fish is a tranquilizer without adverse side effects. But salt-water aquariums are costly to equip and maintain, and there is growing concern over the environmental damage that the tropical fish trade has inflicted on the world's coral reefs and other fragile oceanic habitats.

Fortunately, the computer screen offers a low-maintenance virtual aquarium. Software can provide an unlimited supply of virtual fish. Many screen savers, like After Dark's delightful Fish! module, exploit our fascination with colorful swimming creatures. El-Fish is something much grander, an aquarium construction set, a work of art, and a stunning example of leading-edge software technology.

You design your fish tank by selecting a background and a gravel pattern. Then you select and place your plants, rocks, and other objects. To populate your tank, go fish! You can click anywhere on a map of an imaginary archipelago and the program will start "catching" an appropriate sample of fish.

These are not real species, but rather the product of elaborate "genetic algorithms" that simulate fish-like appearance and behavior. You can "breed" fish by combining the genetic code of two dissimilar species. Each fish is animated as a series of 256 frames. Since this takes up awesome amounts of disk space, you can reduce your favorites to "roe"—simple text files of only a few kilobytes that can easily be archived or traded with other users. Screen shots can be saved in .PCX or .TIF format.

There are cute animated objects, like a cat's paw that takes an occasional swipe at your fish from the upper edge of the screen. If you have an audio card, the program can generate musical accompaniment in eight different styles. There is even a utility to import standard MIDI files. The illustrated 90-page *User's Manual* is supplemented by an 8-page installation and troubleshooting guide and a useful Read Me file.

The program requires massive computer resources: at least 4MB of RAM and about 10MB of free hard disk space. Without a math coprocessor it can take *hours* for the program to render and animate a new species. To really appreciate the high-resolution graphics (640 x 400 pixels), you need a fast Super VGA card with at least 512K of video RAM. The program is installed from compressed files on four high-density 3.5" disks (other disk formats are available).

El-Fish demonstrates what Russian-American collaboration can accomplish. The design and programming was done in Moscow by Animatek, a team of Russian scientists and scholars. The development, packaging, documentation, and marketing was done by Maxis, those wonderful folks who brought you SimCity, SimEarth, and other software toys.

Marine biologists may be disappointed by the program's lack of real fish species, and its neglect of physiological variables like temperature, salinity, and oxygenation. Hard-core gamers may be disappointed by the lack of sharks and piranhas to eat the other fish. You have to appreciate El-Fish as a pure software toy, not as an ecological simulation. (Maxis, 2 Theatre Square, Suite 230, Orinda, CA 94563-3346. 510/254-9700, 1-800-336-2947)

PC SOFTWARE REVIEWS

MAJESTIC PLACES—MEDIACLIPS CD-ROM

Published By: Aris Entertainment
List Price: $39.95
Reviewed By: Woody Liswood

MediaClips

Majestic Places contains one hundred images and one hundred WAV files from a variety of places and landscapes.

To display and listen to all these goodies, you need an MPC-compatible microcomputer. Or, you need a Mac with System 6.06 or later, 8- or 24-bit color display, 32-bit color QuickDraw, and a CD-ROM drive.

The images and sounds are royalty free, although if you use them commercially, you must give credit to the artist.

The illustration of Half Dome was in full color on the CD-ROM. I downloaded it in both 8-bit BMP and PCX, as well as 24-bit TIF. All of the images had equal quality.

The software engine which drives the CD-ROM uses a display like your VCR. Arrows go forward or backward. A speaker horn turns on or off the sound. A clipboard displays all one hundred images at the same time so you can jump directly to the one you want. A slide show just rotates the pictures and the sound files until you stop it.

The display images are set for 800 x 600. On my 1024 x 768 screen, they were rather smallish, but perfectly usable.

At this price, it's not a bad way to add to your collection of potential images and sounds to gussy up any business or personal

Continued on page 89

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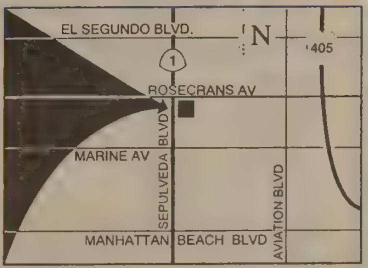

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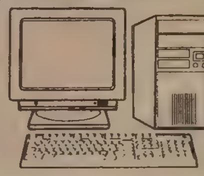

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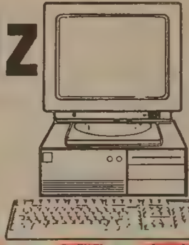

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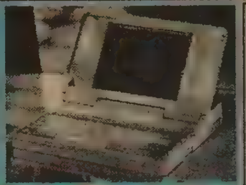

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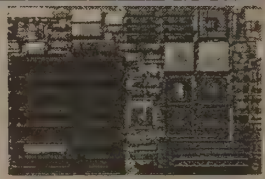

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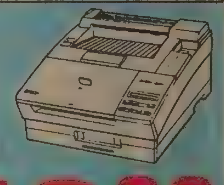

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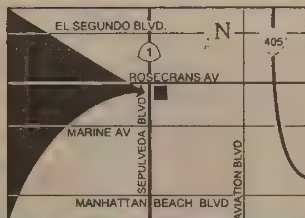

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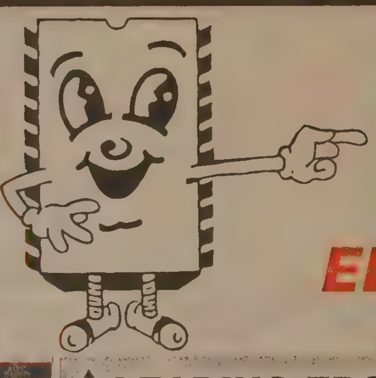

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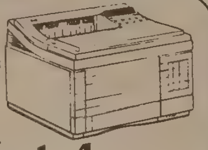

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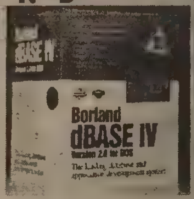

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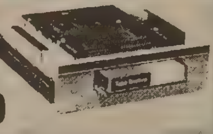

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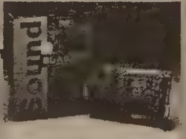

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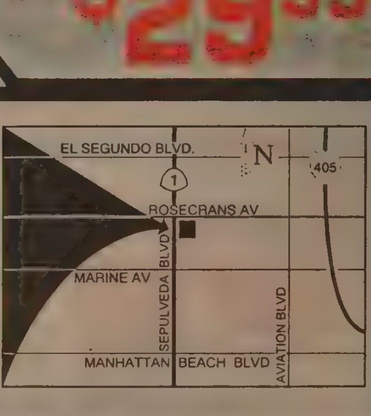

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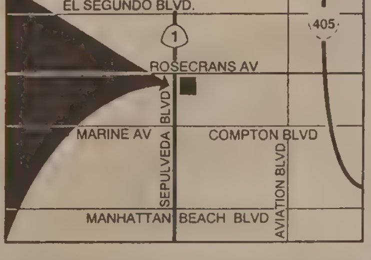

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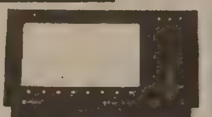

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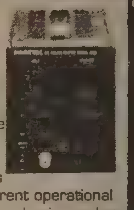

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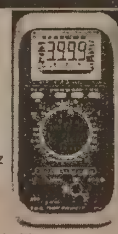

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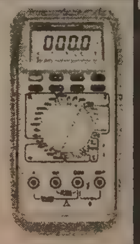

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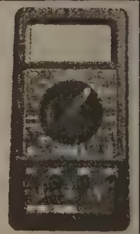

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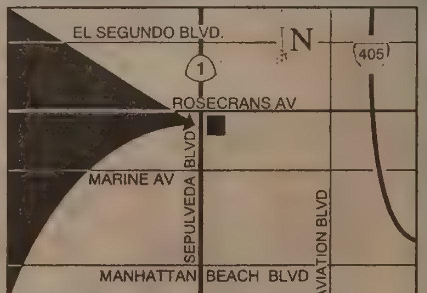

Continued from page 82

presentation. (Aris Entertainment, 1042 D. Indian Rd., Ashland, OR 97520. 503/488-4864)

DRIVEPRO

Published By: Micro House
List Price: $99.95
Reviewed By: Woody Liswood

A while back I reviewed the hard drive dictionary from Micro House . Now that I have their companion DrivePro software, which does everything I can think of doing to a hard drive, I'm even more convinced that anyone who installs or services hard drives must have both the disk and the dictionary.

DrivePro runs from a floppy. When it boots, you get a screen telling everything is discovers about your drive in the CMOS. If you are installing a brand new drive, you can select it from DrivePro's internal dictionary, and DrivePro will set the CMOS parameters for you. If you lose your CMOS, you can let DrivePro reset it for you, assuming that you didn't to write down the drive parameters when you started the computer.

In addition to containing all of the popular drive parameters, DrivePro lets you do diagnostics on IDE, ESDI, MFM, and SCSI hard drives. DrivePro also formats, partitions, and edits any sector of any disk.

DrivePro does get fancy. When you partition your hard drive, you can have a number of different types of boot records. The Master Boot Record is the program code located on the first sector of the hard drive and is run every time you boot your disk. DrivePro lets you have a multi-boot record, which will allow you to boot from any bootable partition on the disk. DrivePro can create a normal boot record, just like you used the FDISK program which comes with DOS. DrivePro also creates a BIOS extended boot record. This type of record lets you have a custom drive type which is not contained in your BIOS.

One of the problems DrivePro solves is a when your hard disk will not boot. One solution is to redo the low level format. Another is to try to redo the SYS option which comes with DOS. Your other option is to let DrivePro create a new master boot record as well as a new DOS boot record and, if you wish, put in a new set of DOS system files. If you are a support person, this single feature could save you most of your hair, which you no longer need to pull out when you contemplate a computer that should boot, but doesn't.

The documentation is well done, showing illustrations of each of the screens you will encounter, and containing lucid information about the program and its features. If, however, you are technically astute enough to really need this program, you'll will probably never need to look at the documentation, since the menu structure is self-explanatory, and everything works as expected. (Micro House, Inc., PO Box 17515, Boulder, CO 80301. 303/443-3388)

PC HARDWARE REVIEW

BACKPACK HARD DRIVE

Manufactured By: MicroSolutions
List Price: $669, 80MB drive
Reviewed By: Woody Liswood

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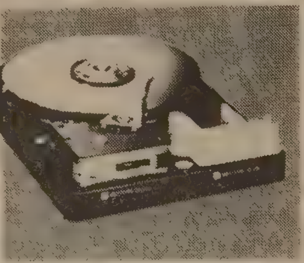

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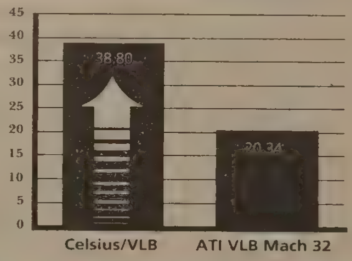

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Backpack is a no-slot, portable hard drive which attaches to your microcomputer through the parallel port. Your printer attaches to the Backpack and receives passthrough information.

I tested the 80MB drive with a variety of desktop and laptop computers. It worked perfectly with the different devices. You simply load a device driver through the config.sys file, and your system will recognize Backpack as just another drive.

For anyone regularly working with several computers and transferring information between them, backpack is ideal. Back up programs see Backpack as a DOS device. For transferring, backup to the Backpack, at hard disk speeds. Take the Backpack to the other computer, and restore the data. This works faster than tapes or floppies.

If you have an older laptop with no hard drive, Backpack offers a great solution. But, since Backpack is not battery powered, your older laptop will become a bit less portable. If you only work in hotel rooms or in an office, Backpack is a great choice.

Backpack measure 1.5" x 4" x 7.75" and weighs 2lbs. by itself. The wall plug, with transformer, adds another pound. The average access time was around 20 milliseconds. It has shock resistance of over 5G when not operating and 5G when in use. I dropped mine at least twice when traveling and never had a problem. About the only thing I could not figure out was how to make Backpack into a boot device. (MicroSolutions, Inc., 132 W. Lincoln Highway, DeKalb, IL 60115. 815-756-3411)

AMIGA SOFTWARE REVIEW

IMAGEFX

Published By: Great Valley Products
List Price: $259
Reviewed By: Douglas J. Nakakihara

Great Valley Products has delivered one of the most comprehensive 24-bit image processing packages available on any desktop computer platform. ImageFX includes tools for color balancing, color effects, image compositing, image manipulation, filtering, morphing, and special effects. You can even touch up images or create new ones from scratch using the painting tools. There are a variety of scanners and framegrabbers, and of course, ARexx is also supported. Since it loads and saves in many different formats (BMP, TIFF, JPEG, ILBM, and Targa to name only a few), it is perfect for multiple-platform environments and file conversions. You can even print PostScript files.

The working display, where you actually work on an image, supports native Amiga modes, Firecracker 24, HAM-E, or IV24. You can also render an image to another display device using DCTV, EGS, or SAGE file formats. More modes are sure to be added. Button gadgets are logically arranged on its slick interface.

Continued on page 100

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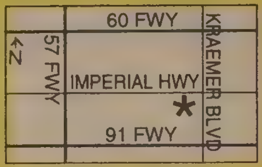

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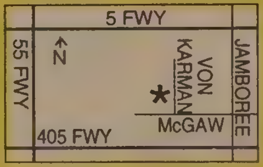

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- 256K High Speed Cache Memory
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- TEAC 1.2MB & 1.44MB Floppies
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- Diamond Viper 32bit VLB 2MB VRAM Card
- Nec 3FGe 15" Non-Int. SVGA Monitor
- Northgate Omnikey 101 keyboard
- Diamond Mid tower case with 250W
- MS DOS 6.0
- MS Windows 3.1
- Full burn-in
- 1 year parts & labor warranty

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- Diamond Mid tower with 250W
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2 EISA/VLB
6 EISA
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- 16MB, 70ns RAM, exp. to 64MB
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- Maxtor 340MB IDE, 13ms
- TEAC 1.2 & 1.44 floppies
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- Northgate Omnikey 101 keyboard
- Diamond Mid tower case 250W
- MS DOS 6.0
- Windows 3.1
- Full system burn-in
- 1 year parts & labor warranty

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- 256k Hi Speed Cache Memory
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- TEAC 1.2 & 1.44 floppies
- Orchid or Quest 32bit VLB IDE Controller
- Diamond Stealth 32bit VLB 1MB VRAM Card
- NEC 3FGe 15" Non-int. SVGA
- Northgate Omnikey 101 keyboard
- Diamond Mid tower case 250W
- MS DOS 6.0
- Windows 3.1
- Full system burn-in

Two Bus
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VLB Slots

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- Mid Tower Case
- Full system burn-in
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VLB Slots

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- Conner 170MB Hard Disk
- Paradise Window-Accelerator w/1MB 1280 x 1024, 16.7M Colors, 16 Bit True Color
- IDE Dual FD/HD Controller
- 2 Serial, Parallel, Game Port
- 14" SVGA 1024 x 768 (.28) Monitor
- 101 Enhanced Keyboard

Motherboard Made By IBM

CPU	IBM48650	486DX33	486DLC33
MIPS	19.4	14.5	11.2
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- 256K CACHE RAM
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- 101 KEYBOARD

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ISA486

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- 256K CACHE RAM
- 4MB RAM UP TO 32MB
- 1.2MB & 1.44MB FLOPPY DRIVE
- 170MB HD
- DUAL IDE FD/HD CONTROLLER
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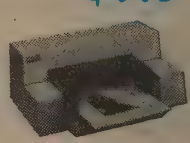

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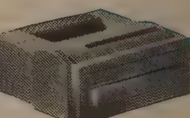

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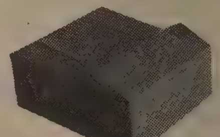

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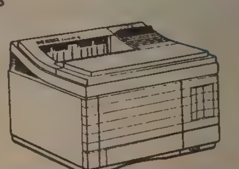

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- 1.2MB & 1.44MB FLOPPY DRIVE
- 125MB HD, 17MS (BUILT-IN 32K CACHE)
- DUAL IDE FD/HD CONTROLLER
- AT I/O: 2 SERIAL/1 PARALLEL/1 GAME
- 16 BIT SUPER VGA CARD W/1MB RAM
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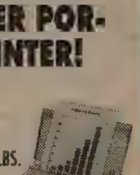

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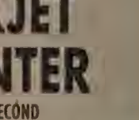

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- UP TO 100 SHEETS
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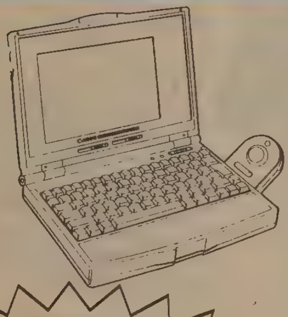

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486 Notebook

Built-In
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Two-In-One!

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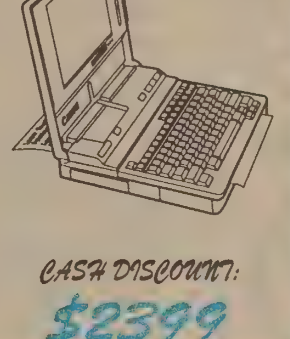

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- 80MB HARD DISK
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- 120MB HARD DISK
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- VGA, 2 SERIAL, PRINTER PORT
- CARRYING BAG
- LOGITECH TRACKBALL
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- 10" VGA DISPLAY
- 4MB RAM
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- 1.44MB FLOPPY DRIVE
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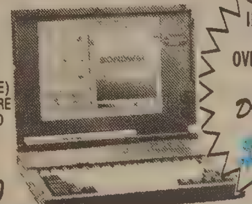

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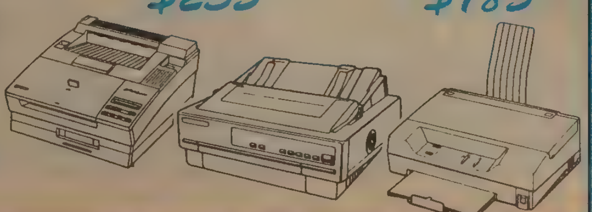

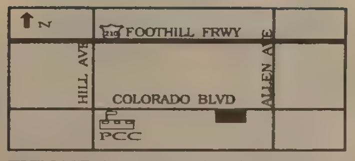

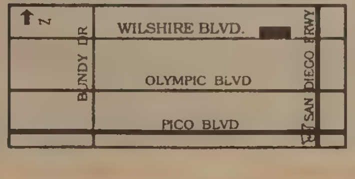

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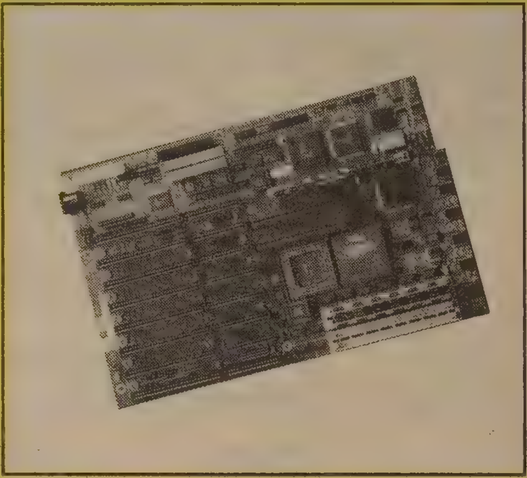

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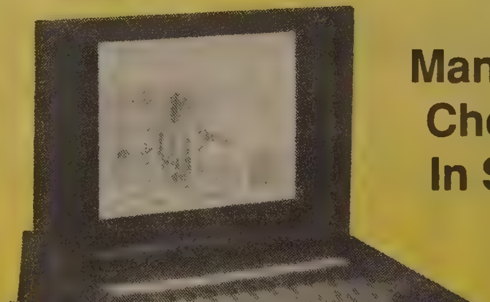

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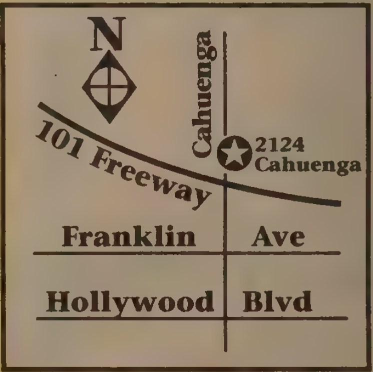

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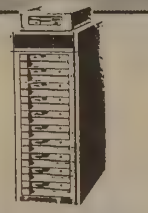

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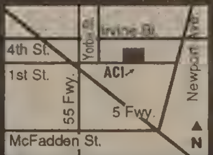

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Continued from page 93

Though images are internally 24-bit, a palette of only 256 colors is provided for painting and rendering. The palette can be changed without affecting the picture, however. When ranges are used, ImageFX will spread colors between ranged palette colors. The color spreads must be seen to be appreciated!

The release I got had a few minor quirks which should disappear very soon with updates. Otherwise, ImageFX is a very mature product. This package is a must-have for anyone doing image processing. (Great Valley Products, Inc., 600 Clark Ave., King of Prussia, PA 19406. 215/337-8770)

VISTAPRO 3.0

Published By: Virtual Reality Laboratories, Inc.
List Price: $99.95
Reviewed By: Douglas J. Nakakihara

VRL has refined and added many new features to Vistapro in the recently released v3.0. Essentially, Vistapro generates landscape images based on elevation data. Included with the program are a variety of data files from Yosemite to Mars, and additional landscapes are available. You can further customize the terrain with user-definable trees, rivers, lakes, snow, stars, etc. Modify or create your own landscapes with the optional TerraForm program ($39.95).

Using the new Cloud Panel, realistic clouds can now be easily added. These also animate extremely well. Many other improvements further enhance the realism of the rendered landscapes. AGA, IFF24, Firecracker, DCTV, and HAM-E support is featured with image sizes up to 4096 x 4096! Vistapro now includes the ability to watch it render the image.

Vistapro lets you individually place trees, grass, buildings, and roads on your topographic map for even greater realism. Other images can be loaded in either foreground or background. Use Vistapro images as backgrounds in your favorite 3-D rendering package. Landscapes can even be saved as TurboSilver objects!

Animated sequences are made possible using Vistapro's rich scripting language. The optional MakePath program ($39.95) lets you quickly generate scripts. Even in lo-res mode, these "fly-by" animations are breathtaking. You can also use the scripts for quickly setting user preferences. I've barely had room to touch the surface, but suffice it to say that Vistapro is great fun and a recommended buy. 4MB RAM required. (Virtual Reality Laboratories, Inc., 2341 Ganador Court, San Luis Obispo, CA 93401. 805/545-8515) ■

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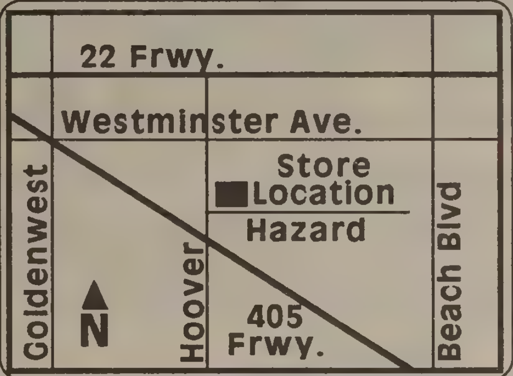

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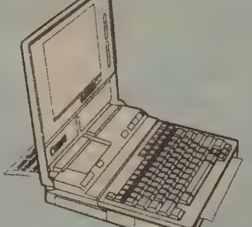

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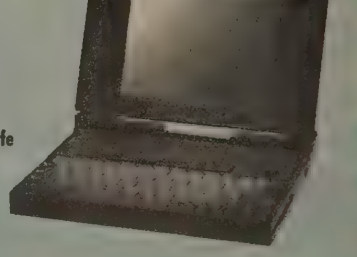

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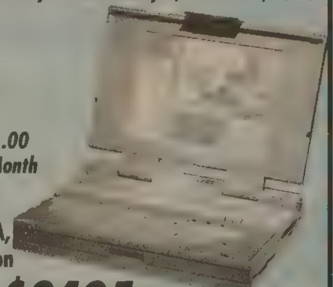

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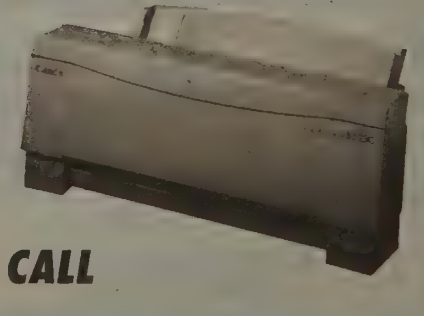

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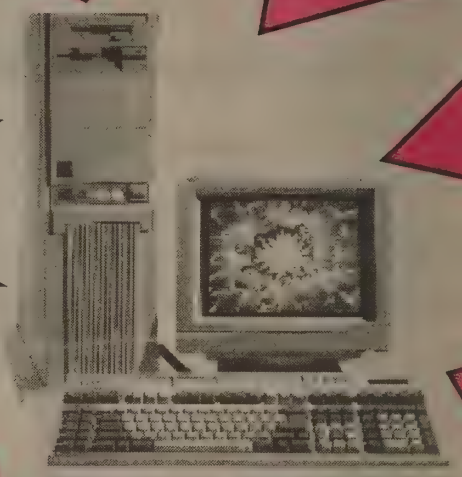

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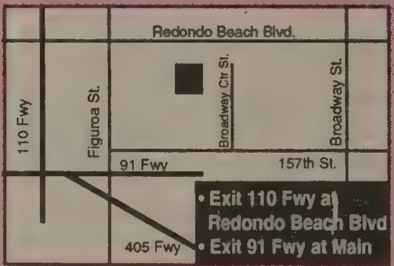

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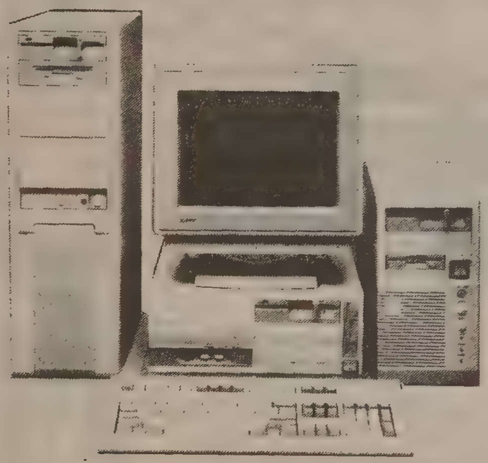

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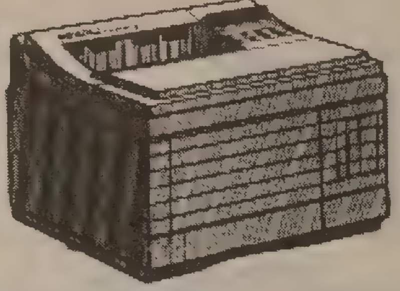

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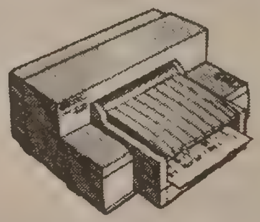

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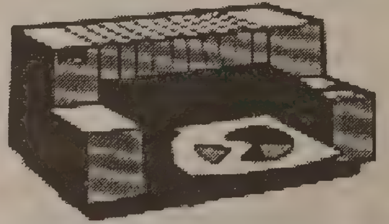

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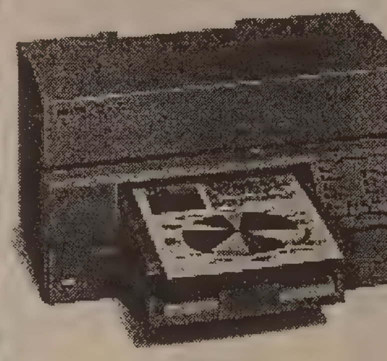

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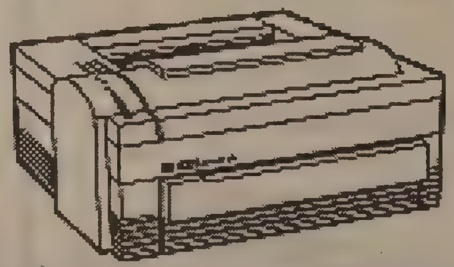

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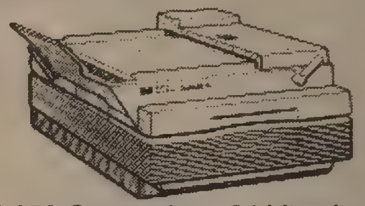

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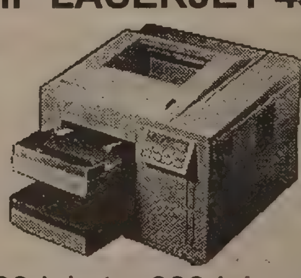

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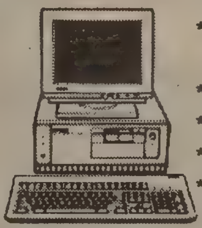

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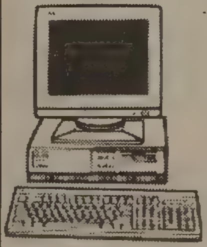

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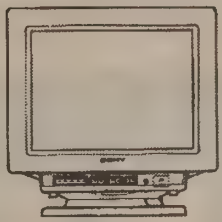

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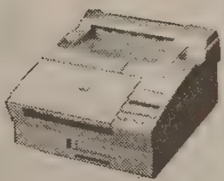

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continued from page 16

other major system software vendors have begun showing almost-working versions of porting software that either allow programmers to port much faster, or allow many programs to run on different operating systems unchanged. The result is that for any computer, the number and quality of programs may go up dramatically in the next year.

Although few of the technologies announced actually exist, they seem promising. The ability to run Macintosh programs under Windows, and vice versa, springs from the similarities in the two interfaces. When a programmer writes a program, he or she puts in statements that ask the operating system for certain user interface features, such as the standard "Open" dialog box. If the way the programmer asks for such features is very similar on two different operating systems, such as the Macintosh and Windows, another program can intervene and make statements for one computer act exactly like the other computer wants. This additional program can either work with the programmer, allowing one set of statements to make two or more kinds of programs, or it can help the user run a program originally written for one kind of computer to run flawlessly on another.

Sunselect, a spin-off from Sun Microsystems, and UNIX Systems Laboratories have recently announced Wabi (Windows Application Binary Interface), a program that allows Windows programs to run unchanged on Intel-based UNIX systems. According to the companies, programs run under Wabi run just as fast under UNIX as they do under Windows. For UNIX users, this will mean that they will have access to most (but probably not all) Windows 3.1 programs now available. Even though many Windows 3.1 programs have counterparts that were written to specifically run under UNIX, many more people are familiar with Windows programs such as Word for Windows and Excel. The program will probably be available early next year, according to the companies.

Similar situations will probably exist in the Windows and Mac worlds this year. Both Apple and Microsoft have been showing developers systems that allow them to change existing programs to work on the other system, and some smaller developers will also be selling such systems. Although Apple's system, called Bedrock, won't be ready until next year, Microsoft's system, code-named Wings, may be available this year. Apple has more to gain by keeping Macintosh developers from giving up the Mac altogether and going towards the much larger Windows market, of course, but Microsoft has acknowledged that many of its developers would like to crack the well-established Mac market too.

Although the act of porting is mostly of concern to programmers, the results are important to everyone. If Windows programs can run on UNIX systems, for example, current Windows users will be more willing to risk the transition to UNIX. If Windows programs can be run on the Mac, Apple can sell more Macs. Either way, Microsoft gains because Windows is the platform of origin, and can therefore sell more copies of Windows. ■

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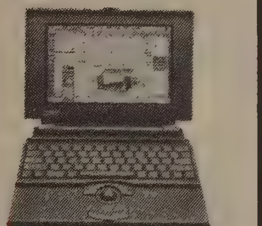

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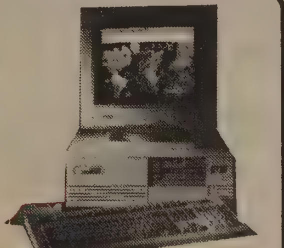

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MICROTIMES INDEX SURGES TO RECORD HIGH

Led by strong gains by Lotus, Symantec, and LSI Logic, to name just a few, the MicroTimes Stock Index took wing during the monthly trading session ended May 27.

When the books were closed on the four-week trading session, here is how our industry fared: the MicroTimes Stock Index, which monitors the financial health of the 32 stocks in the adjacent table, raced ahead 479.87 points, or 11.8%, en route to a new record high of 4554.5. In comparison, the Dow Jones Industrial Average also smashed through its previous record high last month, as it rallied a robust 129.71 points, or 3.79%, to an all-time high of 3554.83.

Lotus topped the leaderboard last month with a resounding 39.2% gain to $35.50. The company's recently released 1-2-3 Release 4 for Windows continued to garner high accolades from the computing community last month. As a result, Lotus took largest percentage-gained honors of the lot last month.

Hewlett-Packard was another one of the leaders last month after it rallied 15.1% to close at $84.88. The computer maker reported a better-than-expected second-quarter earnings report. The bottom line for the Palo Alto-based concern last month: earnings swelled to $347 million from $323 million last year thanks to a surge in demand for its computers and printers. Separately, Hewlett-Packard announced plans to buy BT&D Technologies, which manufactures high-speed fiber-optic components. BT&D was a joint venture between British Telecom (BT) and Du Pont (D). Terms of the agreement were not disclosed.

Intel charged ahead $17 a share and was the largest dollar-gainer for the period. Merrill Lynch raised its 1994 earnings estimates by 19% last month to $14 a share and said the stock still "looks very undervalued."

Even Sun Microsystems got into the act as it sprang forward 16.9% to $31.13. A *Wall Street Journal* profile said the company now faces a delicate balancing act when it comes to marketing software based on its workstation's operating system while it faces increased competition in hardware sales. Potential competition from the Apple/IBM alliance, from Intel's Pentium chip, and Microsoft's new Windows NT may offer buyers machines that equal the power of a Sun workstation, but at a lower price.

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	SOFTWARE											
OTC	Adobe	(H)	ADBE	57.25	67.63	10.38	18.12	34	0.40	0.59	67.63	25.25
OTC	Aldus		ALDC	15.00	16.25	1.25	8.33	90	0.00	0.00	21.00	10.25
OTC	Autodesk		ACAD	40.25	50.75	10.50	26.09	26	0.48	0.95	56.50	32.75
OTC	Borland		BORL	22.25	25.88	3.63	16.29	–	0.00	0.00	54.50	17.50
OTC	Informix	(H)	IFMX	37.50	45.00	7.50	20.00	27	0.00	0.00	49.75	12.13
OTC	Lotus	(H)	LOTS	25.50	35.50	10.00	39.22	21	0.00	0.00	36.75	14.75
OTC	Microsoft	(H)	MSFT	85.50	94.13	8.63	10.09	31	0.00	0.00	95.25	65.50
OTC	Novell		NOVL	29.25	29.50	0.25	0.85	32	0.00	0.00	35.25	22.50
OTC	Oracle	(H)	ORCL	34.88	43.63	8.75	25.09	62	0.00	0.00	43.63	14.00
OTC	Software Publishing		SPCO	7.88	7.38	–0.50	–6.35	–	0.00	0.00	15.00	6.75
OTC	Symantec		SYMC	12.75	17.13	4.38	34.31	–	0.00	0.00	44.25	5.88
	HARDWARE											
OTC	Apple		AAPL	50.75	57.38	6.63	13.05	14	0.48	0.84	65.25	41.50
OTC	AST Research		ASTA	13.75	17.00	3.25	23.64	10	0.00	0.00	24.25	11.25
NYS	Commodore	(L)	CBU	4.38	4.00	–0.38	–8.57	–	0.00	0.00	12.50	3.50
NYS	Compaq	(H)	CPQ	47.38	58.88	11.50	24.27	18	0.00	0.00	59.75	23.13
NYS	Digital Equipment		DEC	43.38	44.75	1.38	3.17	–	0.00	0.00	49.25	30.38
OTC	Dell		DELL	28.63	23.63	–5.00	–17.47	10	0.00	0.00	49.88	15.00
NYS	Hewlett–Packard	(H)	HWP	73.75	84.88	11.13	15.08	25	1.00	1.18	88.88	50.25
NYS	IBM		IBM	48.88	53.25	4.38	8.95	–	2.16	4.06	100.38	45.88
NYS	Silicon Graphics	(H)	SGI	32.50	36.75	4.25	13.08	–	0.00	0.00	37.38	16.13
OTC	Sun Microsystems		SUNW	26.63	31.13	4.50	16.90	26	0.00	0.00	41.00	22.50
NYS	Xerox		XRX	75.38	75.50	0.13	0.17	–	3.00	3.97	88.88	66.75
NYS	Tandy		TAN	29.38	32.00	2.63	8.94	29	0.60	1.88	32.13	22.25
	CPU'S											
NYS	Advanced Micro Devices		AMD	29.13	29.38	0.25	0.86	13	0.00	0.00	32.88	7.38
OTC	Intel		INTC	95.75	112.75	17.00	17.75	17	0.40	0.35	121.25	47.75
NYS	LSI Logic		LSI	10.63	13.63	3.00	28.24	–	0.00	0.00	14.13	4.88
NYS	Motorola	(H)	MOT	72.25	82.25	10.00	13.84	33	0.44	0.53	82.88	37.13
	COMMUNICATIONS											
NYS	AT&T	(H)	T	56.13	61.63	5.50	9.80	21	1.32	2.14	62.38	40.63
NYS	BellSouth Corp.		BLS	53.13	52.00	–1.13	–2.12	16	2.76	5.31	57.50	46.75
OTC	MCI	(H)	MCIC	46.88	52.88	6.00	12.80	23	0.10	0.19	53.63	29.88
NYS	Northern Telecom		NT	36.25	36.25	0.00	0.00	18	0.36	0.99	46.00	30.50
NYS	Pacific Telesis		PAC	46.25	47.38	1.13	2.43	22	2.16	4.56	49.38	39.25

KEY: NYS = NEW YORK ASE = AMERICAN OTC = OVER THE COUNTER
(H) = NEW HIGH REACHED IN PERIOD (L) = NEW LOW REACHED IN PERIOD

MARKET DIARY:

ADVANCES	27
DECLINES	4
UNCHANGED	1
NEW HIGHS	11
NEW LOWS	1

MOST ACTIVE ISSUES:

LARGEST DOLLAR GAINER	Intel	$	17.00	
LARGEST DOLLAR LOSER	Dell	$	–5.00	
LARGEST PERCENTAGE GAINER	Lotus		39.22	%
LARGEST PERCENTAGE LOSER	Dell		–17.47	%

	CLOSE 04/29/93	CLOSE 05/27/93	NET CHANGE IN MONTH	PERCENT CHANGE IN MONTH
MICROTIMES STOCK INDEX	4074.63	4554.50	479.87	11.78
DOW JONES INDUSTRIAL AVERAGE	3425.12	3554.83	129.71	3.79
STANDARD & POOR'S 500 STOCK INDE	438.89	452.41	13.52	3.08
N.Y.S.E. COMPOSITE	242.48	249.43	6.95	2.87
NASDAQ COMPOSITE	658.45	704.59	46.14	7.01

CLOSING QUOTES FOR GRAPH:

DATE	MICRO TIMES	DOW JONES
10/23/92	3536.03	3207.64
12/10/92	3825.83	3312.19
01/11/93	4020.09	3262.75
02/05/93	4083.40	3442.14
03/04/93	4127.80	3398.91
04/01/93	4196.89	3439.44
04/29/93	4074.63	3425.12
05/27/93	4554.50	3554.83

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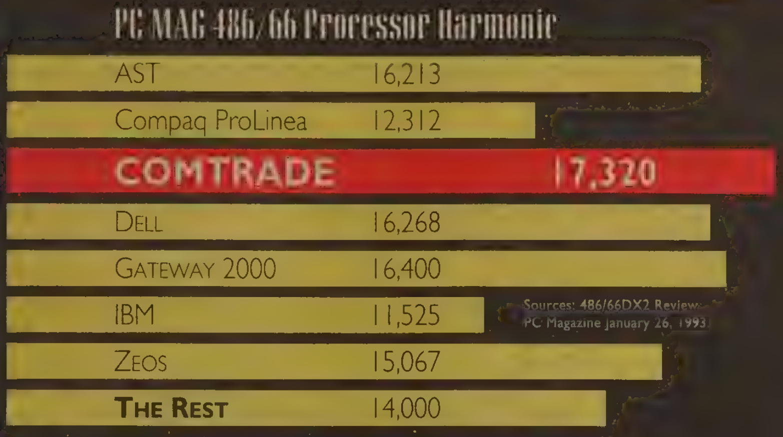
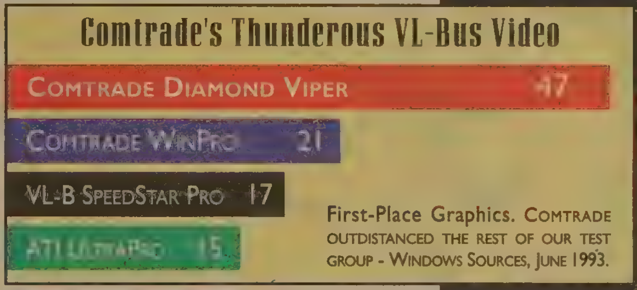
Comtrade Zaps The Competition!



Sources: 486/66DX2 Review: PC Magazine january 26, 1993

Processor & memory performance are the most important elements to achieve top performance. It is foundational, unchangeable, determined by a systems actual design. As you can see, Comtrade is technologically superior by design. And Comtrade takes this design excellence even further: to maximize performance, now every Comtrade system has a 32-bit ultra fast Hard Drive controller and a VL-Bus graphics accelerator for a total 32-bit video and hard drive solution.

The Comtrade 486 achieved the best processor performance of all profiled systems.
- PC Sources, February 1993.



First-Place Graphics. Comtrade outdistanced the rest of our test group - Windows Sources, June 1993.

WinMark 3.1 (Million pixels per second)

Pentium Ready

Once again **"The Comtrade PC"** has the competition running for cover. In review after review, critic's applaud Comtrade shocking speed and extraordinary value. According to the recent PC Magazine, Comtrade's 486 system "Has The Performance Issue Licked." It's no wonder Comtrade is awarded PC Sources Magazine **"Direct Hit"** (Best Buy/Editor's Choice) (Feb 1993). "It's A Very Swift Graphics Machine," says Computer Shopper (May 1992). "That Deserves Serious Consideration from Anyone Who Wants to Juice up Windows." Comtrade's latest VESA Local Bus WinPro or Viper graphics accelerators are even up to 3 to 5 times faster than our previously reviewed systems.

No Contest!
Comtrade processor outpaced all the other - Windows Sources, June 1993.

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- 250MB 12ms IDE Drive with 64K Cache
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- 2 Serial, 1 Parallel & 1 Game Ports
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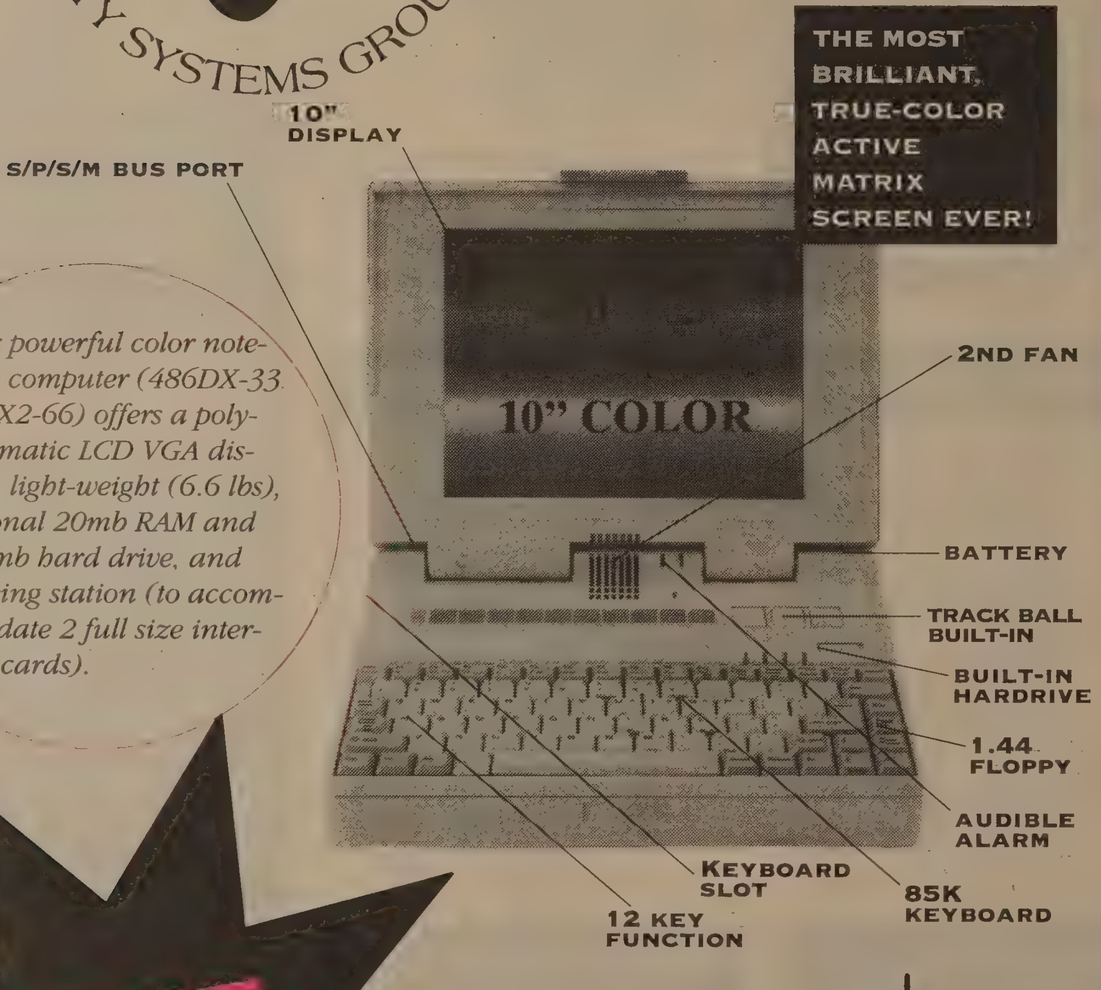
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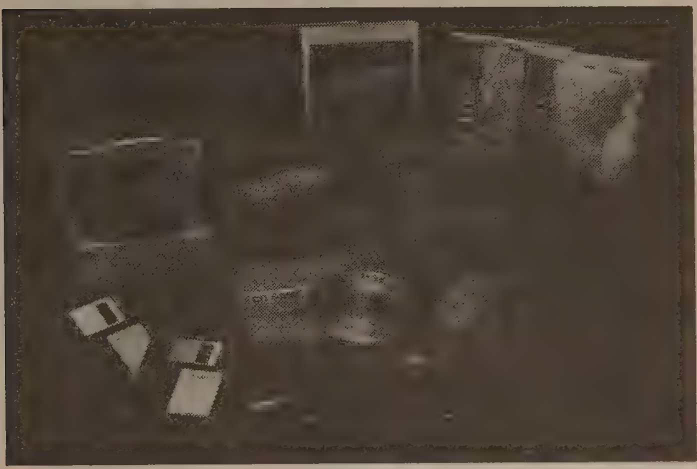

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MTBF:	250000H

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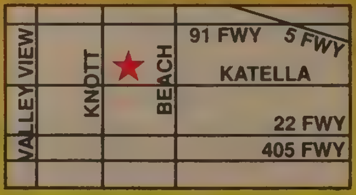

"It is this fundamental problem. I want to be accepted by the mainstream, but at the same time I find the mainstream boring. I want the rest of the world to discover Eastern Europe, but of course once they do, I'll be headed for the interior of Russia or something. It's like everything else, it keeps moving. Which of course is why it's interesting."

continued from page 59

of other people's intellectual property, which he's clearly not, he's a very principled guy.

Yeah. But he is living off MIT...

And doesn't see the conflict.

Exactly. And it's the same thing—people who say the Internet is free, it ain't free.

Everything gets paid for somehow.

So take my own newsletter—I'd very much like to put it up on AMIX and have it in smaller chunks. I'd like more people to read it. We're still trying to figure the pricing of it and all that.

On the other hand, it is mine—

And a lot of work goes into it.

Yeah. But I don't get emotionally upset if I see a Xerox of it around. [laughs] I once went to stay at a friend's house and I saw a Xerox of it on his kitchen counter and I just sort of put something on top of it. ... And in Eastern Europe, I pretty much say "Hey, do whatever you want with it."

But I can afford to do that because the other people do pay me for it. And I'd much rather have what I would consider a fairer system. Even people who pay for it and don't copy it, they probably don't read every issue because it's such an eclectic thing. I'd rather have somebody pay for it than not pay for it, but in the end if somebody genuinely can't afford it and they really would read it and so on and so forth, then I'd like them to read it. So I give a lot of them out free at trade shows.

Do you expect to be doing this forever?

No. No, but for the foreseeable future. I really like it.

My belief is that learning is adaptation; it's changing the model you have in your head. If you can't change your model you can't learn. Knowing is having a model; learning is being able to change your model in response to what you hear and see. And that's what I'm about—I keep changing my models, and going out and finding places that are just starting to create their models, like Eastern Europe or the new areas of the PC business or object-oriented progamming or whatever.

If you asked me what I'm good at, I'd say that it's pattern recognition. My aunt was an interpreter and spoke eight languages. She could do simultaneous interpretation. You just have to have a nose for it. Partly I feel that I operate in this huge cloud, and there are all these different kinds of droplets in it. If a certain droplet goes by three or four times, you develop a sensitivity to it.

Then my job each month is to go out into this cloud and, do a self-organizing activity in my brain, make something with identity and with form out of what looked like a chaotic mass. Because there actually is a structure inside it if you can discover it.

What I keep hearing is that one of the key drivers behind all this is what you think is interesting. Is there a common denominator to what you think is interesting?

No, it's kind of what I don't understand, and what other people don't understand, but it seems ready. When I first started in this business I would look for the expert, and now what I like is finding things where there is no expert, where you have to go to a lot of people.

Usually I've been thinking "This is a topic I should get to at some point" for five or six months. What I'm doing this month, for example, is meetings.

See, one of the wonderful things about my life is I don't have any meetings. I have meetings with vendors, and I go to large meetings, but I don't have the kind of meetings that make everybody groan, where every Monday morning you meet with the sales team.

I started going to some of these meetings by being on boards of things. I had a boyfriend once who told me that he really didn't understand sex until he went to bed with his second girlfriend. You can't separate the individual from the experience, but once you've had experiences with several individuals, or several boards, then you know what's generic and what's particular.

I was just kind of interested in this, and what made a meeting go well and what didn't. There's a bunch of these meeting-software companies which didn't really turn me on, because I didn't think you can replace it with software.

It was one of these things where these droplets were coming by and coming by, and then I had a lot of personal experience with meetings. So finally I just thought "Okay, I've got to understand this, I think it's important. People spend a lot of time in meetings."

Now I'm talking, for example, to the facilitator EFF uses, who is absolutely wonderful. Aside from being a wonderful facilitator, she's also a very smart woman. I'm going to see Ventana Corp. and probably Artisoft tomorrow; I've talked to two guys yesterday who are both doing meeting tools.

They sort of float in. And people who talked to you a year ago when you weren't ready, you remember them and you call them back. Then you ask people, who do you know, or what book did you read, and so you follow these tentacles.

If there's a hundred people, you need to talk to ten; in order to get the ten who are good enough, you need to talk to twenty, of which ten are the right ones. You don't need to talk to all hundred. But you need to talk to more than one or two; you need to triangulate and calibrate ideas and build a number of models.

What I try and do is make the topic concrete and figure out what are the structural dynamics of it.

For example, in a meeting, the smallest meeting is two people, or maybe somebody talking to himself. And the largest meeting is Bill Clinton talking to millions of people. And then in the middle there's the meetings where things really happen, where there's a lot of interaction but it's more complex than two people.

Another breakdown is, there's the intellectual content of the meeting, and the emotional, social. ... The intellectual content you can do very nicely with software, but the leadership, the motivation, the resolution of personal conflicts, is another part of it.

Another two axes are, there's the content of the meeting, both the emotional and the intellectual, and there's the process of the meeting.

And you need a lot of bandwidth for all that stuff.

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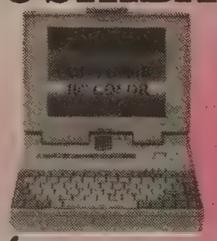

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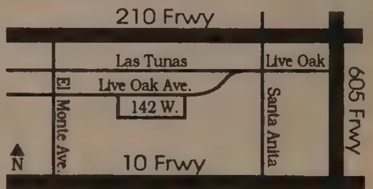

Yeah. And to be a facilitator—this is sort of interesting. It's like you have to sacrifice a virgin every two years. Because when you start as a facilitator with a subject and a group you don't know, you're not very effective. As you begin to understand the content you become better at managing the process to focus on the content properly. So for a while you're really really good.

But then the problem is...

It eats you.

Yeah. Because first you walk in and you don't know who the jerks are and who the good guys are. Then you find out who they are, and you deal with them appropriately and you know how to shut the jerks up.

But you're not on the good guys' side. You're on the side of the content. But if you stick around too long, you inevitably develop your own ego, and...

So these are the kinds of things I'm discovering about the dynamics, and I suspect a lot of it just can't be done in software, but I'm trying to make it clear what can be and what can't.

It's going to be really fun. So that's an example of how I do it.

When you meet with companies, what do you talk about?

As you can imagine, you talk to them, you try things out on them, you say, well, here's my thesis, what do you think? You listen to them talk about their own products. But what you really do is the creation of a model out of different conflicting pieces of data and different conflicting models.

Sometimes I feel as if I'm the marketing guy for these people. "Okay, so what's your positioning?"

And sometimes they haven't thought about it very much.

Precisely. That's what I try and do. For a field can self-organize itself, you need to have the parts of it interact. Within the community, the parts need to interact to create the community. You can't have a community of things that don't interact. A living thing is cells and stuff interacting. And then an interesting issue is how much your brain is neurons interacting and stuff.

What do you find interesting about the Eastern European thing?

It's the creation of a new market—intellectually it's all this Santa Fe Institute stuff about self-organizing systems.

Personally I like doing things where I can have impact, rather than helping someone increase their market share 2%, and where if I don't do it nobody else will, as opposed to where I'm replaceable by somebody else.

I just like watching it grow. I speak Russian, and I feel at home there. I like going somewhere where I have friends but I'm not known.

You don't have to go around being Esther Dyson.

Yeah, it's always more challenging to persuade someone to talk to you than to fend off people you don't really want to talk to who have heard you're famous and want to bother you.

But it's more—in the US you have to be competitive in the sense of "Are you being included? Who gets to be the keynote speaker here, there, and everywhere else?" And at some point you realize, "Gee, it's not that thrilling to be the keynote speaker."

Been there, done that...

In Hungary or somewhere, you go and you feel you're telling people something new that they haven't heard before and they're interested. It's just exciting to watch something start. This valley 20 years ago was the same, and now it is, in pockets, but there's more of a mainstream to fight off.

And whatever comes along has to exist in the context of what's already entrenched.

It is this fundamental problem. I want to be accepted by the mainstream, but at the same time I find the mainstream boring [laughs]. I want the rest of the world to discover Eastern Europe, but of course once they do, I'll be headed for the interior of Russia or something. It's like everything else, it keeps moving. Which of course is why it's interesting. ■

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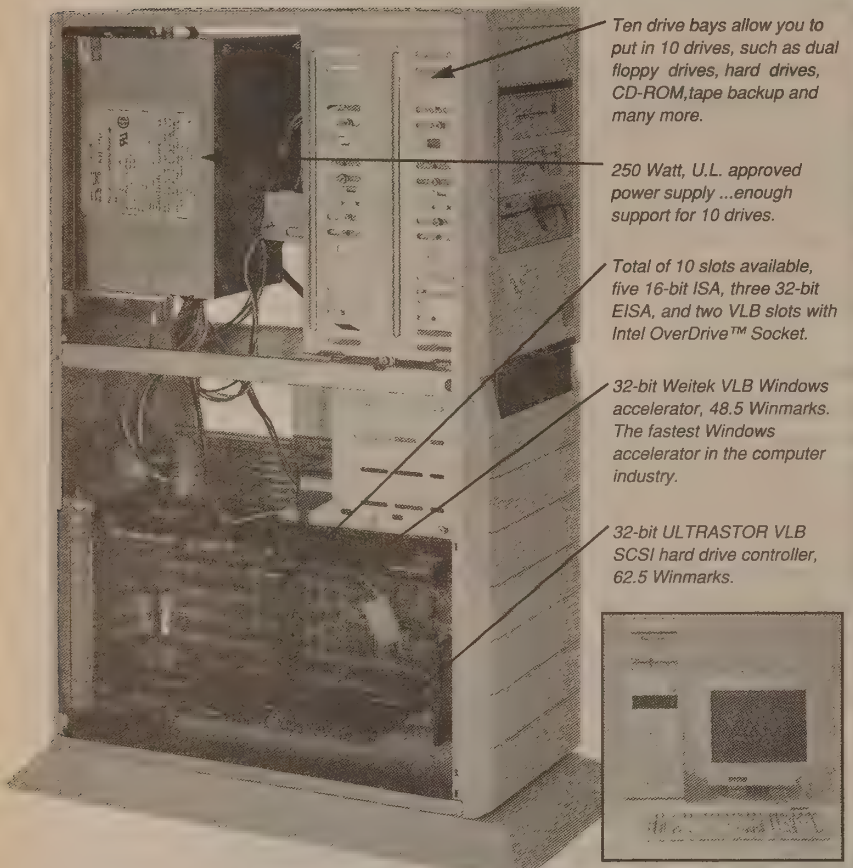

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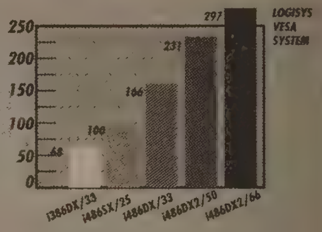

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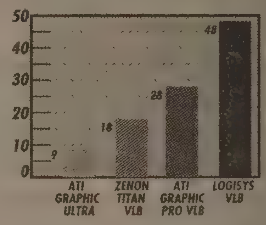

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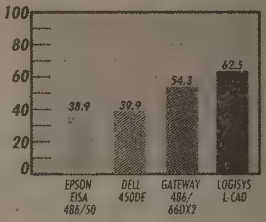

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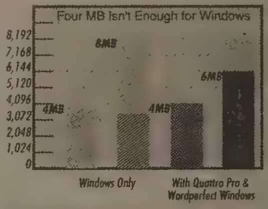

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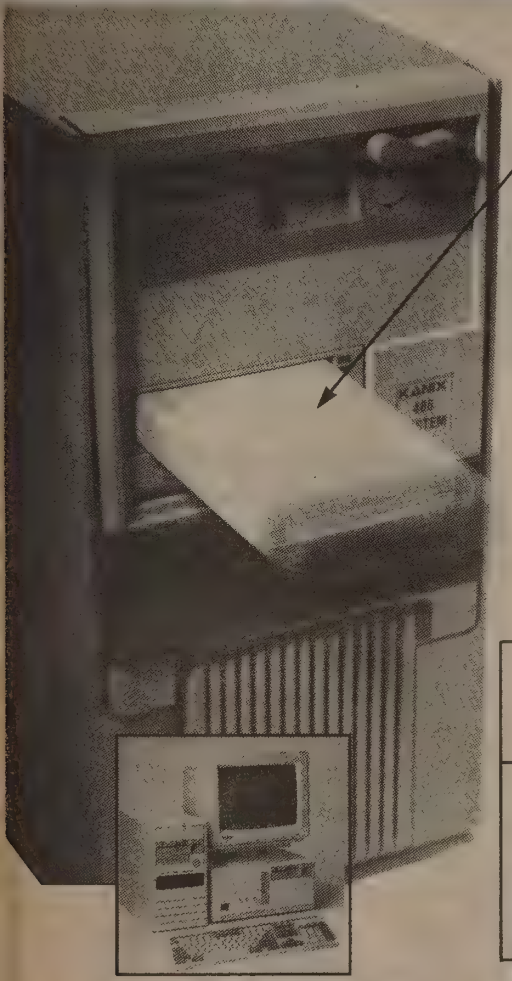

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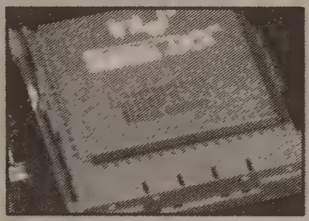

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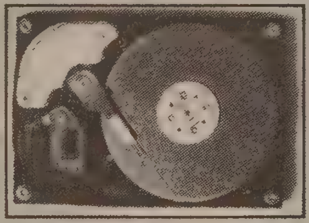

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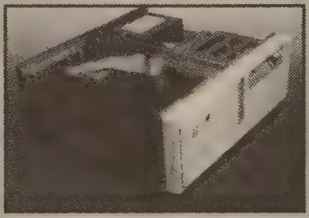

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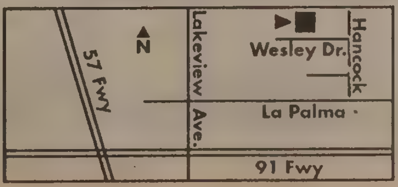
486SX-25.....$1,159
386DX-40.....$1,120



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RESOURCES

Calendar Of Events

CONFERENCES, EXPOS, SHOWS, AND OTHER SPECIAL EVENTS

JUNE

June 10–11 Computer Show & Sale. CSUN, North Campus. Richard James Corp. Call: 1-800-433-7469.

June 12 Computer Show & Sale. CSUN, North Campus. Richard James Corp. Call: 1-800-433-7469.

June 12–13 CorelDraw User Conference. Burbank. Association of Corel Artists & Designers. Call: (818)563-ACAD.

June 13 Computer Show & Sale. Antelope Valley Fairgrounds. MarketPro Shows. Call: (415)388-8893.

June 14–15 Outsourcing Conference. San Francisco. DCI. Call: (508)470-3880.

June 14–16 Database World Conference & Exposition. Boston. DCI. Call: (508)470-3880.

June 14–17 Electronic Messaging ’93 Conference. Atlanta. EMA. Call: (703)875-8620.

June 14–17 Object World Expo. San Francisco. IDG World Expo Corp. Call: 1-800-225-4698.

June 19 Computer Show & Sale. Anaheim Stadium, indoors. Richard James Corp. Call: 1-800-433-7469.

June 20 Computer Show & Sale. San Diego. MarketPro Shows. Call: (415)388-8893.

June 21–22 Technology Policy In The ’90s Conference: Critical Strategic Concerns For The Telecommunications & Biotechnology/ Medical Products Industry. Cambridge, MA. MIT. Call: (617)862-0397.

June 23–26 Seybold Digital World Conference. Beverly Hills. Seybold Seminars. Call: (310)457-8551.

June 26–27 Computer Show. LA Fairgrounds, Pomona. Computer Marketplace. Call: 1-800-800-5600.

JULY

July 3 Computer Show & Sale. Ventura Co. Fairgrounds MarketPro Shows. Call: (415)388-8893.

July 3 Computer Show & Sale. Glendale Civic Auditorium. Richard James Corp. Call: 1-800-433-7469.

July 10 Computer Show & Sale. Riverside Convention Center. MarketPro Shows. Call: (415)388-8893.

July 11 Computer Show & Sale. San Diego. MarketPro Shows. Call: (415)388-8893.

July 17 Computer Show. LA Fairgrounds, Pomona. Computer Marketplace. Call: 1-800-800-5600.

July 18 Computer Show. Sherman Entertainment Center, Reseda. Computer Marketplace. Call: 1-800-800-5600.

July 24 Computer Show & Sale. Anaheim Stadium, indoors. Richard James Corp. Call: 1-800-433-7469.

July 24 Computer Show & Sale. Oxnard Civic Center. MarketPro Shows. Call: (415)388-8893.

July 25 Computer Show & Sale. Antelope Valley Fairgrounds. MarketPro Shows. Call: (415)388-8893.

July 31 Computer Show & Sale. CSUN, North Campus. Richard James Corp. Call: 1-800-433-7469.

AUGUST

August 1 Computer Show & Sale. Glendale Civic Auditorium. Richard James Corp. Call: 1-800-433-7469.

August 1–6 SIGGRAPH ’93. Anaheim. ACM. Call: (312)321-6830. Email: info92@siggraph.org.

August 3–5 Downsizing Expo. Santa Clara. DCI. Call: (508)470-3880.

August 7–8 Computer Show. LA Fairgrounds, Pomona. Computer Marketplace. Call: 1-800-800-5600.

August 14 Computer Show & Sale. CSUN, North Campus. Richard James Corp. Call: 1-800-433-7469.

August 21 Computer Show & Sale. Anaheim Stadium, indoors. Richard James Corp. Call: 1-800-433-7469.

August 26–27 Electronic Book Fair. San Francisco. Sumeria, Inc. Call: (415)904-0811.

August 28 Computer Show. LA Fairgrounds,

JUNE 26–27

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JUNE 23–26

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July 17
Saturday
POMONA - L.A. County Fairgrounds (Fairplex)

July 18
Sunday
RESEDA - Sherman Entertainment Center
From 101 Freeway, take Reseda off ramp, turn left (if traveling East) on Reseda Blvd. to Sherman Way, turn right, one block to Canby Street. 18430 Sherman Way.

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Saturday
Santa Barbara - Earl Warren Showgrounds
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August 7 & 8
Saturday & Sunday
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August 28
Saturday
POMONA - L.A. County Fairgrounds (Fairplex)

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Calendar Of Events continued

Pomona. Computer Marketplace. Call: 1-800-800-5600.

CLASSES, SEMINARS, AND WORKSHOPS

JUNE

June 12 Quicken For DOS Class. Irvine. CPU Group. Call: (714)251-0112.

June 12 Quicken For Windows Class. Irvine. CPU Group. Call: (714)251-0112.

June 14 Basic AutoCAD Class. Laguna Hills. Computer Education Institute. Call: (714)472-4192.

June 14–15 WordPerfect 5.1 Class. Laguna Hills. Computer Education Institute. Call: (714)472-4192.

June 15 CorelDraw Level 1 Class. Irvine. CPU Group. Call: (714)251-0112.

June 15 Quicken For DOS Class. Irvine. CPU Group. Call: (714)251-0112.

June 16 Paradox 4.0 Level I Class. Irvine. CPU Group. Call: (714)251-0112.

June 16 Windows 3.1 Class. Laguna Hills. Computer Education Institute. Call: (714)472-4192.

June 17 Harvard Graphics Level I Class. Irvine. CPU Group. Call: (714)251-0112.

June 17 Quicken For Windows Class. Irvine. CPU Group. Call: (714)251-0112.

June 19 Novell System Manager Class. Laguna Hills. Computer Education Institute. Call: (714)472-4192.

June 29 Configuring Your PC Class. Irvine. CPU Group. Call: (714)251-0112.

June 21 Paradox For Windows Level I Class. Irvine. CPU Group. Call: (714)251-0112.

June 21–25 Multimedia: Hands-on Seminar. Los Angeles. Apple Computer. Call: 1-800-263-7017.

June 22 Harvard Graphics Level II Class. Irvine. CPU Group. Call: (714)251-0112.

June 22 Paradox For Windows Level II Class. Irvine. CPU Group. Call: (714)251-0112.

June 23 Paradox For Windows Level III Class. Irvine. CPU Group. Call: (714)251-0112.

June 25 DOS Class: How To Use The Disk Operating And Hard Disk Management. Monrovia. The Organizers. Call: (818)303-3311.

June 25 Quattro Pro Level II Class. Irvine. CPU Group. Call: (714)251-0112.

June 26 WordPerfect 5.1 Level I Class. Monrovia. The Organizers. Call: (818)303-3311.

June 28 Lotus 1-2-3 Rel. 2.3 Level I Class. Monrovia. The Organizers. Call: (818)303-3311.

June 28 Quattro Pro Level III Class. Irvine. CPU Group. Call: (714)251-0112.

June 28–August 9 QuarkXPress Class. Los Angeles. UCLA Extension. Call: (310)206-1638.

June 29 CorelDraw Level I Class. Irvine. CPU Group. Call: (714)251-0112.

June 29 Paradox 4.0 Level II Class. Irvine. CPU Group. Call: (714)251-0112.

June 30 Harvard Graphics Level III Class. Irvine. CPU Group. Call: (714)251-0112.

JULY

July 7 WordPerfect 5.1 Level I Class. Monrovia. The Organizers. Call: (818)303-3311.

July 10 Lotus 1-2-3 Rel. 2.3 Level I Class. Monrovia. The Organizers. Call: (818)303-3311.

July 10 Windows 3.1 Class. Monrovia. The Organizers. Call: (818)303-3311.

July 12 Basic AutoCAD Class. Laguna Hills. Computer Education Institute. Call: (714)472-4192.

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- 14" CTX Super VGA Monitor .28dp Non-Interlaced
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- Trident 8900CL SVGA Card with 1MB
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- 101 Key Enhanced Keyboard
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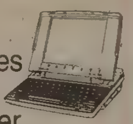

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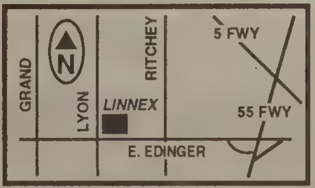

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486 DX2/66 ISA (256k).....$660
486 DX/33 ISA (256k)......$470
486SLC66 IBM CPU..........$490
486SX25/33 ISA 64k...$240/270
386DX 40Mhz (64k).........$170
386 DX 25 Mhz $140
386 SX/33Mhz ISA..........$100
286 20 / 25 Mhz.........$75/87
286 12 / 16 Mhz $55/65

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-Panasonic 4410/4420
-Epson 6000/7000
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15" SVGA .28 NI VESA..$380
17" Samsung SVGA.......$695
20" .31 SVGA 1280.........Call

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120MB/170MB...$189/219
210MB/245MB...$310/350
340MB/520MB...$430/800
1.2MB FDD................$49
1.44MB FDD...............$47
1.2MB Teac FDD........$55
1.44MB Teac FDD......$52

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IDE Controller..........$10
IDE w/ I/O Cntl......$16
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SCSI Controller.......$70

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Honeywell Keyboard...$45
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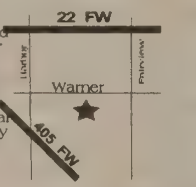

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Calendar Of Events continued

July 13 Quicken 6.0: Manage Your Finances Class. Monrovia. The Organizers. Call: (818)303-3311.

July 14 Windows 3.1 Class. Laguna Hills. Computer Education Institute. Call: (714)472-4192.

July 17 WordPerfect 5.1 Level I Class. Monrovia. The Organizers. Call: (818)303-3311.

July 17 Lotus 1-2-3 Rel. 2.3 Level II Class. Monrovia. The Organizers. Call: (818)303-3311.

July 19 Novell System Manager Class. Laguna Hills. Computer Education Institute. Call: (714)472-4192.

July 19–20 WordPerfect 5.1 Class. Laguna Hills. Computer Education Institute. Call: (714)472-4192.

July 21–22 Intro To Networking PCs With Novell Seminar. San Diego. Center for Advanced Professional Development. Call: (714)261-0240.

July 22 Software Licensing Agreements Seminar. San Diego. Center for Advanced Professional Development. Call: (714)261-0240.

July 24 DOS Class: How To Use The Disk Operating And Hard Disk Management. Monrovia. The Organizers. Call: (818)303-3311.

July 24 WordPerfect 5.1 Level II Class. Monrovia. The Organizers. Call: (818)303-3311.

July 30 C++ Course. Orange. ICCA. Call: (714)738-3686.

July 31 Lotus 1-2-3 Rel. 2.3 Level III Class. Monrovia. The Organizers. Call: (818)303-3311.

July 31 WordPerfect 5.1 Level III Class. Monrovia. The Organizers. Call: (818)303-3311.

AUGUST

August 1 Lotus 1-2-3 Rel. 2.3 Class. Monrovia. The Organizers. Call: (818)303-3311.

August 7 Microsoft Excel 4.0 Class. Monrovia. The Organizers. Call: (818)303-3311.

August 8 Lotus 1-2-3 Rel. 2.3: Macros Class. Monrovia. The Organizers. Call: (818)303-3311.

August 15 Word For Windows 2.0 Class. Monrovia. The Organizers. Call: (818)303-3311.

August 16–18 Software Safety: Principles And Practice Short Course. Los Angeles. UCLA Extension. Call: (310)825-1047.

August 23–26 Applying Quality Management Principles To Software Development Short Course. Los Angeles. UCLA Extension. Call: (310)825-1047.

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Atlantis, The Lost BBS. (714)256-1360, (818)859-6300. 2400/9600/14,400. Multiline chat, games, travel, scuba, forums, SIGs. Grand opening specials. Sysop: Ron DeRuyter. [Exp. #111.]

Aussie BBS. (818)337-9701, (909)598-2502. 8-N-1. 10 lines, chat, games, highest quality adult GIFs, 18,000 files, and more. Sysop: Mike Szabados. [Exp. #112.]

BaudTown BBS. (213)294-7791, (805)259-5442, (805)584-9680, (818)893-0340, and others. 24 hrs. 32 conference lines, chat, matchmaker, databases, library, and more. [Exp. #112.]

The Castle. (213)953-0040, (818)985-2392, 409-9365. 8-N-1, 24 hrs., 1200/2400/9600/14,400. 25 lines, multi-user games, chat, net mail. Free trial. Sysop: Steve de Mena. [Exp. #110.]

CPI BBS. (213)566-3004, (310)366-7472, (818)281-5760. 8-N-1, 24 hrs., 1200/2400/9600/14,400. 10 lines, nationwide mail, echo conferences, matchmaker, multiuser games, files, and more. All ages welcome. Free trial. [Exp. #112.]

KBBS Los Angeles. (310)558-0145, (310)532-1700 (818)886-0872. 8-N-1, 300/1200/2400/9600. LA's busiest, with 32,000 channel chat, 13,000+ files, 32 lines, parties, over 3000 members. [Exp. #112.]

Modem Butterfly. (213)264-6900, (310)767-1010, (714)828-5500, (805)581-0700, (818)798-9900, 842-6900, 887-7900. 8-N-1, 1200/2400/9600. Instant access, 1GB, SIGs, 33 conference lines, events, trivia contests. Sysop: Karyn Zoldan. [Exp. #110.]

ModemBoy. (310)659-7000 (818)996-7900. 8-N-1, 1200/2400. Instant access, free chat, 1GB, 32 lines, serving the gay/curious community. [Exp. #110.]

The Motherboard. (213)650-0519, (310)421-3767, (714)521-1175, (805)520-2300, (805)287-5957, (818)989-3875. 8-N-1, 24 hrs., 300/1200/2400. 32 lines, multiuser/group & private chats, 2GB, email, public forums, library, and matching. More local numbers available online. Sysop: Celeste Clark. [Exp. #111.]

VVBBS-Valley Village BBS. (213)628-9640, (310)276-9970, (818)763-8160. 8-N-1, 24hr. 40+ new files every day, great games, friendly sysop! Free trial. [Exp. #112.]

213

The Career Network. (213)629-1472. 5 pm–1:30 am, 300/1200/2400. Job hunting? Your resume can reach over 250 major employers each month. Sysop: Steven McCormick. [Exp. #112.]

LAAUGLine. (213)387-1002. 24 hrs., 300/1200/2400. Amiga. Sysop: Thom Irwin. [Exp. #112.]

PhotoPro! BBS. (213)223-9285, 227-7127. 1200/2400/9600/14,400/16,800. Six lines, 30,000 files, 45,000 msgs, online games, U'NInet. Sysop: David Spellman. [Exp. #110.]

US Pompeii/InfoTran Networks. (213)878-2801. 8-N-1, 24 hrs., Local and int'l BBS, 32 lines, chats, pubs, games. One month free trial. Sysop: Zippy Manus. [Exp. #112.]

310

Amiga Artists Club & BBS. (310)618-0538. 8-N-1, 24 hrs., 300/1200/2400/9600/16,800. UL/DL, 170MB, Art SIGs, Amiga bases, and online games. [Exp. #110.]

The Bizopps Connection. (310)677-7034. 8-N-1, 24 hrs., 300/1200/2400. Provides listings of business and franchise opportunities and more. Free trial. Sysop: Lawrence. C. Toliver. [Exp. #110.]

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Compu-Net! BBS. (310)822-0038. So. Cal's largest file and msg board. CD-ROMs, dating, adult, Windows, IBM, UFO, Mac, and more. [Exp. #111.]

The Great CHR$ (27) BBS. (310)693-7907. 24 hrs., 12 Steps, all languages, shareware, code samples, tech talk. No fees. Sysop: Alan Selmanaj. [Exp. #110.]

Ground Zero BBS. (310)430-0079. 300–16,800. 3 lines, Windows, OS/2, 39,000 files, QWK mail, RIME, and U'NI networks. Sysop: Rick Edwards. [Exp. #112.]

LA Computer Society BBS. (310)827-8171. 8-N-1, 24 hrs., 2400 only. Full access to Computer Society members ($36/yr), message bases, SIGs, and club information. Sysop: Frances Ames. [Exp. #112.]

LAMG (Los Angeles Macintosh Group). (310)559-MACS. 8-N-1, 24 hrs, 300/1200/2400/9600/14,400. So. Cal's busiest all Mac multiline BBS. 300MB of Mac news, reviews, rumors, and more. [Exp. #110.]

Mac-HAC'ers BBS. (310)549-9640, 549-9664. 8-N-1, 24 hrs., 300–16,800. All computers, over 4GB of programs, 3 CD-ROMs, FidoNet Echo mail msg. No fees. [Exp. #110.]

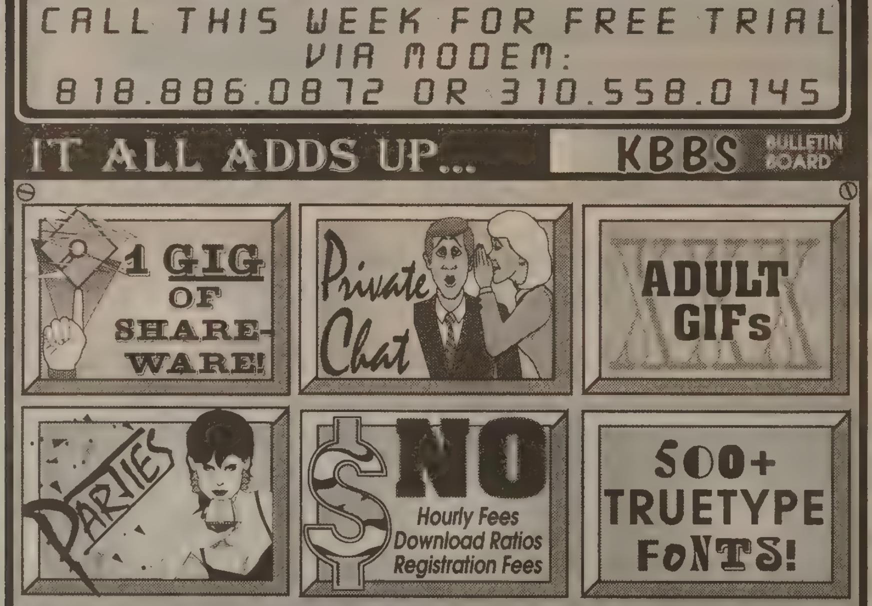
Moroni BBS. (310)392-3981. 24 hrs., 300/1200/2400/9600. LDS-oriented, 650MB shareware. Free. [Exp. #112.]

One World. (310)372-0987. 300/1200/2400/9600/14,400. Ecology, gardening, health, alt.news, Fidonet, USENET, Internet. Free. [Exp. #110.]

the original off off-broadway BBS. (310)453-7038. 8-N-1, 24 hrs., 300/1200/2400/9600. Non-subscription, text files/messages only. Using MajorBBS software and CompuCom Speedmodem. Sysop: James Gossage. [Exp. #111.]

Skeleton Crew BBS. (310)306-5134, (310)306-9775. 24 hrs., 57,600. Shareware, Public Domain, adult GIFs, games,

Continued on page 131



BBS SPOTLIGHT

By John Wolcott

MASTERING YOUR CONNECTIONS

It seems that most of today's full featured BBSs are subscription services. Connecting to these boards can easily add up to more computing bucks than your budget allows. If you'd rather spend money on a bigger, better, faster modem than online subscription time, free BBSs offer an alternative. While you will have to sacrifice some of the features, many of your BBS needs can be met with a "freebie" BBS.

This month's BBS Spotlight features a "free" BBS with a high level of user interaction. The Master Connection, located in Irvine, offers relatively high-speed modem connection with many standard features that include system bulletins, "joining" conferences, file transfer directories, "Doors," a message center for sending or receiving mail, news files, chatting between nodes if another user is currently online, and a listing of users. You also have the ability to "page" the System Operator, leave a message, or view online help files.

The Master Connection BBS runs under PCBoard software v14.5a/10. The two incoming phone lines are supported by US Robotics HST modems, which support up to 19,200 baud with error correction. This software and hardware arrangement run the system smoothly with quite a professional appearance.

The first order of business after you've registered should be to examine the system bulletins. System bulletins cover all of the system information you'd ever want to investigate—user validation and access, policies covering the "do's and don'ts," system navigation with a complete overview of finding your way around, BBS user ethics (a must read), and "Doors."

The Master Connections menu allows you to join any of three conferences: the Main Board, Windows applications, or System Operators areas. The Main Board area is where you'll find most of the files available for downloading and other information of general user interest. To list and download Windows applications, you'll need to join the Windows conference. If you're a sysop and looking to mingle with others of similar interest, the System Operators conference is for you. Choosing a conference area will also put you into message areas relating to your particular curiosities. Switching between conferences is simple. From the Main Menu, choose "J" to join a conference or "A" to abandon a conference and simply select another.

File transfer directories are straightforward, requiring that you type the complete file name as listed in order to download. To streamline your system use, it is a definite advantage to run communications software that will allow you to "scroll back" and view files displayed on the screen. You might also consider dumping specific screen displays to the printer when listing files. This helps to avoid repeated requests to display file lists available for download. There is no upload/download ratio on Master Connections.

The System Operator provides guidelines for posting files. These guidelines are very clear; no copyrighted software, no adult-oriented material, no viruses, no older versions of currently posted software, no money-making business oriented software, and no incomplete or corrupted files. Observing these "no-no's" will make the system a better environment for other users. Generally, when using any BBS, checking your prospective upload files for these conditions will maintain the system's reputation and avoid the loss of system privileges.

Continued on page 135

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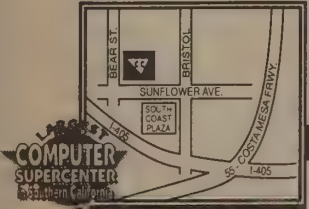

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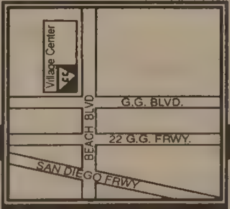

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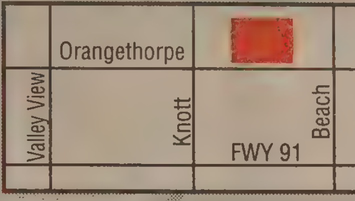

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Bundle	Price
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B. Multimedia Encyclopedia, Book of Animals, Chessmaster 3000, U.S. Atlas, World Atlas, Beacon Teaches Typing 2.0	$95
C. Microsoft Bookshelf, Microsoft Works	$95
D. Tempra Access Photo CD, Book of Animals, U.S. Atlas, World Atlas, Mayo Clinic	$75
E. Mario is Missing, D/Generation, Chessmaster 3000, Wing Commander/Ultima VI, Secret of Monkey Island	$75

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with 128K cache VESA Local Bus, 3 V.L. slots	$700/$680
486 DX 50Mhz ISA	$575/$555
with 128K cache VESA Local Bus, 3 V.L. slots	$600/$580
486 DX 33Mhz ISA	$440/$430
with 128K cache VESA Local Bus, 3 V.L. slots	$465/$455
486 SX 33Mhz ISA	$345/$335
with 128K cache VESA Local Bus, 3 V.L. slots	$370/$360
486 SX 25Mhz ISA	$285/$275
with 128K cache VESA Local Bus, 3 V.L. slots	$310/$300
386 DX 40Mhz with 64K cache	$185/$180
386 DX 33Mhz with 64K cache	$165/$160
386 SX 33Mhz	$125/$120
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VESA local bus Diamond *Stealth 24*, 1MB SVGA card (16.7 million color)	$185/$175
VESA local bus Diamond Viper VLB, 2MB VRAM SVGA card (16.7 million color)	$475/$460
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VESA local bus IDE cache controller (4HD/2HD, 512K to 16MB w/OK)	$190/$180
VESA local bus NE2000 Ethernet card, 10BaseT	$199/$195
Cirrus Logic Windows Accelerator SVGA card with 1MB, 16 million color	$65/$62
16bit NE2000 Ethernet card	$99/$95
16bit NE2000 Ethernet card, 10BaseT	$109/$105
Super IDE (2HD/2FD with 2s, 1p, 1g)	$18/$17
Sound Blaster Pro Deluxe	$135/$130
Sound Blaster 16 ASP	$230/$225

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9600/2400 baud internal fax/modem	$60/$59
14,400 baud internal fax/modem, v.32bis, v.42bis	$179/$169

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Commodore Computing. (714)673-2185. 8-N-1, 24 hrs., 300/1200/2400. Supports C64/128. Free. Sysops: Stephen Fabre/Jay Darrow. [Exp. #112.]

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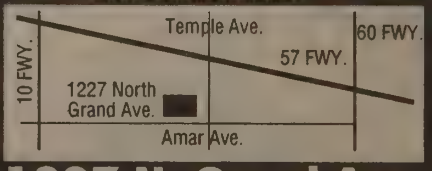

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Cougar Mountain Accounting Software User Group. Call: (818)785-5880. [Exp. #111.]

AMIGA

ATUG—San Gabriel Valley. Meetings: 3rd Sat., 11:00 am, First S. Baptist Church, 4856 N. Golden W., Temple City. Call: Steve, (818)285-6424. [Exp. #115.]

LAAUG—Los Angeles Amiga User Group. Meetings: 3rd Wed., 7:30 pm, Veteran's Memorial Auditorium, Overland Ave. & Culver Blvd. Many SIGs, rookies, monthly PD disks. Call: Kip Hammond, (310)390-3010. [Exp. #111.]

South Orange Commodore Klub—SOCK. Meetings: 3rd Sat., 9:00 am, Computer Guild, Ste. 1003, 24001 Via Fabricante, Mission Viejo. New Location. Supports Commodore and Amiga, new users SIG. Call: Don, (714)830-2430. [Exp. #115.]

APPLE

Orange Apple Computer Club. Meetings: 1st Sat., 9:00 am, Orange Coast College, Chemistry Lab. Apple II supported, presentations, and disk of the month. Call: (714)770-1865. [Exp. #115.]

Original Apple Corps, Apple II User Group. Meetings: 2nd Sun. Support for beginners through experts. Write: PO Box 90065, Los Angeles, CA 90009. Call: Fred Duffy, (310)475-8400. BBS: (310)454-4660. [Exp. #111.]

ATARI

R.A.M. Atari User Group Of Ventura County. Meetings: 3rd Wed., 7:30 pm, Write: PO Box 112, Camarillo, CA 93011. Call: Tim, (805)389-0059. [Exp. #110.]

South Bay Atari Computer Enthusiasts (SBACE). Meetings: 2nd Tues., 7:30 pm, Lomita VFW Hall, 1865 W. Lomita Blvd. Active in all user interests since 1981. Call: (310)375-4839 (10am–10pm). [Exp. #115.]

COMMODORE

C128 West Commodore 128 User Group. Meetings: 3rd Wed., 18645 Arrow Highway, Rec. room. Free membership. Call: John, (818)331-1589; BBS, (714)598-1755 FidoNet. [Exp. #112.]

South Bay Commodore Users Group. Meetings: 3rd Thurs., 7:00 pm, SEC Redondo Generating Station, 1100 Harbor Dr. (across from King Yacht Harbor). Support for 64/128 computers. Open to all users of Commodore Computer equipment and those who would like to receive or exchange information on programs, applications, or hardware. Call: (310)324-8357. [Exp. # 112.]

Southern California Commodore User Group. Meetings: 3rd Wed., 7:00 pm, Church of the Nazarine Christian School, Rm. 18, 15000 Studebaker Ave., Norwalk. Supports C64 & 128 models. Call: Bill Davies, (310)599-1913. [Exp. #112.]

CORELDRAW

Association Of Corel Artists And Designers, Long Beach/Orange County Chapter. Meetings: 1st Tues., Farmers and Merchants Bank, 12535 Seal Beach Blvd., Rossmoor. National organization that provides support for CorelDraw and its associated programs. Call: Ken Wong, (310)835-6000 or (714)821-5378. [Exp. #111.]

Corel (ACAD) User Group. Meetings: 2nd Tues., 7:00 pm, Glendale Federal Bank Building, 401 N. Blvd. Product demos, Q&A. Call: Art, (213)935-1958. [Exp. #111.]

Santa Monica Corel Users. Meetings: 2nd Mon., 7:00 pm, Guest Quarters Suite Hotel, 1707 4th St., Santa Monica. Call: John Youngman, (310)399-3437. [Exp. #113.]

DESKTOP PUBLISHING

Aldus/DTP Users Group. Share ideas and gain knowledge about the standard page layout and graphic design programs on the market. Call: Dave Casad, (310)370-6269. [Exp. #115.]

Southern California Ventura Publisher User Group (SC-VPUG). Meetings: Last Tues., 7:00 pm, 401 N. Brand, Glendale, Glendale Federal Bank Building. Product demos, Q&As, library resources. Call: (818)955-5830. [Exp. #115.]

EPSON

Epson UG/Orange County. Meetings: 3rd Sat, 10:00 am, 2151 Michelson near JW Airport, Irvine. QX, PX, CP/M, VALDOCS—support, tech, periodical & disk library, and parts. Call: (714)893-3305 [Exp. #115.]

IBM & COMPATIBLES

Aldus PC SIG. Meetings: 4th Thurs., 7:00 pm, Graphix Zone, 38 Corporate Park Circle, #100, Irvine. Call: Rick Tuning, (714)549-7352. [Exp. #111.]

Coast IBM PC User Group. Meetings: Last Sat., 9:00 am, Science Hall, Orange Coast College, Costa Mesa. Speakers, BBS, software library, newsletter, and SIGs. Everyone welcome. Call: (714)843-2048. [Exp. #112.]

Greater South Bay PC User Group. Meetings: 2nd Thurs., 7:30 pm, Christ King Lutheran, 2706 W. 182nd St., Torrance. Visitors welcome. Call: (310)329-2804. [Exp. #115.]

Long Beach IBM PC And Compatibles User Group. Meetings: 3rd Wed, 7:00 pm, Masonic Temple, 1220 E. Market St., Long Beach. Novice and experienced welcome. $25/yr, $35 for a family. Call: Jim Wells, (310)439-7114. [Exp. #115.]

Los Angeles Computer Society. Meetings: 2nd Tues., 7:00 pm, Culver City High School Cafeteria. Live presentations and giveaways. Meetings are free. Call: (310)473-6668. [Exp. #114.]

Microlink PCUG. Meetings: 1st Sat., 6:00 pm, La Habra Sr. Center, 165 E. La Habra Blvd., La Habra. Beginners and experts welcome. Free SIG classes. N. Orange Co./San Grabiel Valley. Call: (818)961-6214. [Exp. #115.]

Orange County IBM PC Users Group. Meetings: 2nd Tuesday, 6:30 pm. Computer Learning Center, 1240 S. State College Blvd., Anaheim. Speakers, software, newsletter. Open to public, all welcome. Call: (714)990-0580 [Exp. #115.]

Pasadena IBM User Group. Meetings: 3rd Wed., 7:00 pm, 2184 N. Lake Ave., Altadena. Speakers on hardware/software, SIGs, library, newsletter, and BBS. Call: Steve Bass, (818)791-1300. [Exp. #113.]

Public Domain User Group—Los Angeles. PD software for IBM, Commodore, and CPM computers. All the latest versions. [Exp. #113.]

San Bernardino Personal Computer User Group. Meetings: Last Wed., 7:00 pm, CSU, San Bernardino, Lower Commons, Eucalyptus Rm. Product presentations and sharing information. Call: Arthur Saltzman, (909)880-5755. [Exp. #110.]

San Gabriel Valley/Inland Empire User Group (CHOMP). Meetings: 4th Thurs., 7:30 pm, Harvey Mudd College. Call: Eric Haakenson, (818)308-6025. [Exp. #113.]

Thousand Oaks Personal Computer Club (TOPCC). Meetings: 4th Thurs., 6:30 pm, Goebel Senior Adult Center, 1385 E. Janss Rd., Thousand Oaks. Call: (805)495-8325. [Exp. #115.]

TUG-NET. Meetings: 1st, 2nd & 3rd Thurs., 7:00 pm, Tektronix Corp., 21300 Erwin St., Woodland Hills. Enter through back door of building, press buzzer. Call: (818)249-1629. [Exp. #110.]

Valley Computer Club. Meetings: 1st Wed., 7:00 pm, Burbank Board of Realtors Bldg., 2006 W. Magnolia, Burbank. BBS, PD library, SIGs, newsletter. All welcome. Call: Wes Arnold, (213)221-4433; or Grayce Hruda, (818)842-3707. [Exp. #111.]

Valley IBM/Compatibles User Group (VICUG). Meetings: 4th Fri., 7:00 pm, Van Nuys State Office Bldg., 6150 Van Nuys Blvd. Membership fee $25/yr. or $3 at the door. Call: Harry Tischler, (818)997-1470. [Exp. #110.]

KAYPRO

KAYOS Kaypro User Group. Meetings: 4th Mon. of even months, 6:00 pm, El Segundo Library. Call: (310)379-8339. [Exp. #115.]

MACINTOSH

Los Angeles Macintosh Group (LAMG). Meetings: 3rd Thurs., 7:30 pm, Dept. of Water & Power, 111 N. Hope St. So. Cal's largest all-Mac user group meetings, monthly magazine, classes, PD software, and more. Call: (310)278-LAMG. [Exp. #112.]

Orange Apple Computer Club, Macintosh User Group. Meetings: 1st Sat., 1:00 Pm, Chemistry Lab, Orange Coast College. Presentations and club disks. Call: (714)770-1865 [Exp. #115.]

Original Apple Corps, Macintosh User Group. Meetings: 2nd Sun. Support for beginners through experts. Write: PO Box 90065, Los Angeles, CA 90009. Call: Fred Duffy, (310)475-8400. BBS: (310)454-4660. [Exp. #110.]

San Gabriel Valley Mac User Group. Meetings: 1st Thurs., 7:30 pm, Pasadena Central Library Aud., 285 E. Walnut. Call: (213)684-ICON. [Exp. #111.]

South Bay Apple Macintosh User Group. Meetings: Last Wed., 7:30 pm, Pacific Elementary School, 1214 Pacific Ave., Manhattan Beach. Call: (310)644-3315. [Exp. #115.]

Whittier Area Mac User Group. Meetings: 2nd Sat., 10:00 am, Christian Family Friendship, 11209 First Ave., Whittier. Call: (310)947-2447. [Exp. #111.]

OS/2

West LA OS/2 User Group. Meetings: 1st Wed., 7:30 pm, IBM, 2525 Colorado Place, Santa Monica. Catering to the technical needs of the corporate community. Call: Tracy Ragan, (310)285-3155. [Exp. #112.]

PROGRAMMING LANGUAGES

Business BASIC Users Of Southern California (BBUSC). Meetings: 6:00 pm, Cerritos Sheraton, Cypress Rm., 12725 Center Court Dr., Lakewood. An executive forum for business solutions using Business Basic software. Call: Christian Brantley, (714)379-5454. [Exp. #115.]

SGML

SGML (Signal Generated Markup Language) User Group, Southern California Chapter. Discussions, presentations, tutorials, networking, and educational forums applying to SGML. Call: Roger Waston, (310)337-0309. [Exp. #112.]

TEXAS INSTRUMENTS

TI/944A Home Computer User Group. Meetings: 2nd Mon., 7:00 pm, Pomona First Federal, 9090 Central Ave., Montclair. Monthly newsletter, demos, and fairware. Call: (714)627-3403. [Exp. #110.]

UGOC. Meetings: 2nd Mon., Fidelity Federal, 13820 Seal Beach Blvd. Call: John Bolda, (310)421-1827. [Exp. #113.]

VIDEO TOASTER

Digital Video Forum. Meetings: 3rd Wed., 6:00 pm, Pacific Video Products, 1100 Gene Autry Way, Anaheim. The Video Toaster and associated devices and software is the primary interest. Broad focus of group is the rapidly evolving world of Video/Graphics. Call: Scott Davis, (714)647-5822. [Exp. #112.]

VIRTUAL REALITY

Virtual Reality Special Interest Group (VRSIG). Meetings: The Electronic Cafe, 1649 18th St., Santa Monica. Call: Dave Blackburn, (310)545-0369. [Exp. #110.]

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ASSOCIATIONS

Black Data Processing Assoc., LA Chapter. Meetings: 4th Tues., 6:30 pm, ULTC, 7266 S. Figueroa St., Los Angeles. Call: (310)673-6522, 1-800-727-BDPA. [Exp. #108.]

Data Processing Management Association. Meetings: 2nd Thurs., 7:00 pm. An organization composed of all levels of management personnel who have an interest in the field of information processing. Call: (310)459-9680 or (213)225-9210. [Exp. #108.]

Independent Computer Consultants Association, Los Angeles Chapter. Meetings: 1st Thurs., 6:00 pm. Prepaid reservation, $25, or at the door, $35. The LA chapter provides referral services. Call: (213)872-1811. [Exp. #110.]

Orange County Association Of PICK Professionals. Meetings: 3rd Wed., 6:00 pm, Claim Jumper Restaurant, 18350 Brookhurst St., Fountain Valley. Dinner: Members, $20; non-members, $25. Without reservations add $5 additional. Call: (714)641-6347. [Exp. #110.]

Software Council Of Southern California. A nonprofit trade association whose membership is comprised of software development organizations as well as companies providing support and services to the local software industry. Call: (310)328-0043. [Exp. #112.]

BBSes Spotlight con't.

Continued on page 126

Online games are a stimulating challenge for many BBS enthusiasts and "Doors" is often the favorite feature among users. The online games here include Blakjak, Card Sharx, The Civil War, Operation Overkill, and The Pit. These games put you into the driver's seat in an array of challenging situations. For many users, this is what computers are made for. Although the time allotted to each user for being on the system is limited, many users are able to "rack up" some impressive scores.

A large portion of the Main Menu is dedicated to the message system, allowing you to leave messages for conferences, users, or the System Operator. You may also read messages posted to a conference, perform a text string search for particular topics, or read your personal email. Without a doubt, it is a complete message system.

Friendships are born, system activity is discussed, and the future of computer and modem use is contemplated with chatting between nodes. You may chat with someone else currently connected to the system with this feature.

The System Operator monitors the system frequently and a "page" to the sysop usually yields a quick response. If the sysop is not around, leaving a message will produce a courteous reply soon. It is recommended that you try the system help files or the navigation bulletin before pestering the sysop. Most of your questions will be answered there.

The Master Connection offers a pleasant BBS experience and will afford you hours of entertainment. Simple and courteous BBS practice is a requirement and certainly not too much to ask for such a wealth of service. Sysop Mark Duvall commented, "I really enjoy collecting files and sharing information with other computer users. Running a BBS seems the best way to do that." The Master Connection can be reached by calling (714)651-9815. The typical parameters of 8-N-1 will connect you. If you're looking for a "price is right" BBS, give this one a try.

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John Wolcott is a free-lance writer for computer editorial and hardware and software documentation.

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Free user group and association listings are limited to the group's name and a ten-word description, including the mailing address and contact phone number. They will be **deleted at six-month intervals** to ensure timeliness and accuracy of information. **Free BBS listings** are also limited to the board's name, sysop's name, and a ten-word description including parameters, baud rate, phone number, and registration fee. Because we have an ongoing problem of boards shutting down without telling us, much to the annoyance of would-be callers and the new phone number's owner alike, we will **delete these listings after they've run three months.**

You can update or renew your listings at any time. If yours is missing, send us a new one! Send your listing information to: US Mail should go to: MicroTimes User Group, 3470 Buskirk Ave., Pleasant Hill, CA 94523. **Faxes** are welcome at (510)934-2417 or (213)851-8303.

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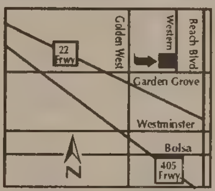

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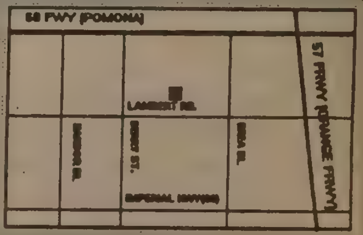

Multi Media & beyond

Sound on the Amiga; multimedia in performance art; Digital World conference preview

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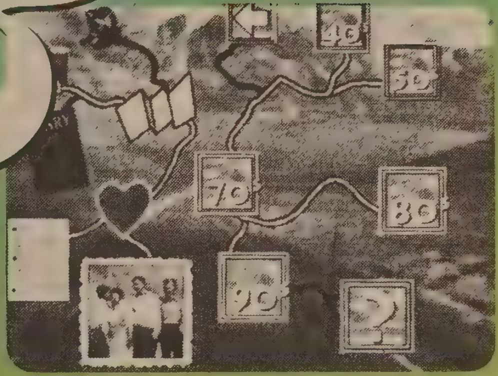
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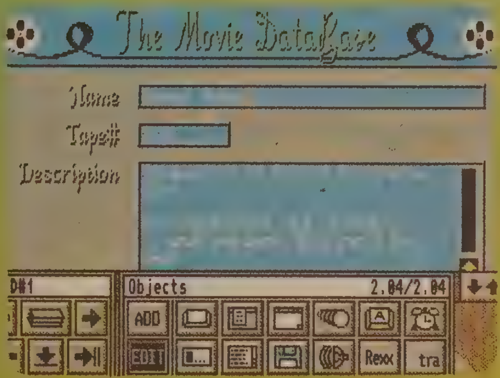
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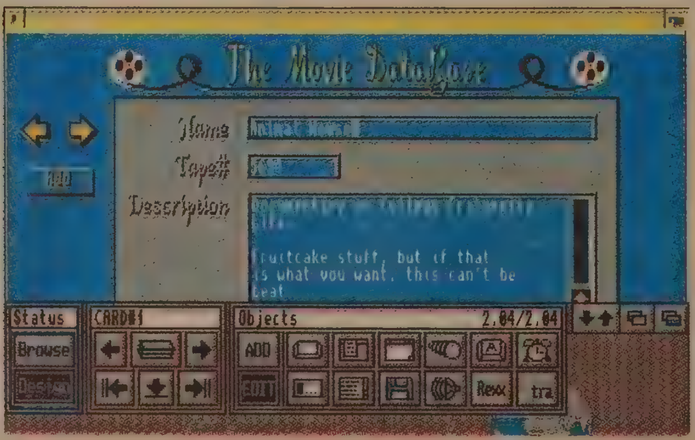
Multimedia involves the combination of graphics and sound into a single integrated presentation. The computer is the common denominator that ties everything together.

The simplest example of multimedia would be a computer graphics slideshow presented with some sort of background music. Of course, multimedia can go far beyond this. Graphics can be animated, and can come from external sources like laserdiscs, videotape, and video cameras. Similarly, audio does not have to be generated by the computer. The same external graphics sources often generate audio too. Audio can also come from MIDI instruments and audio CDs.

For two reasons, the Amiga is really unmatched in multimedia potential: its pre-emptive multitasking operating system, and its ability to display a full-screen animation at an acceptable frame rate. Multitasking provides a means to access functions that may not be featured in the presentation software being utilized—for

CanDo



fruitcake stuff, but if that
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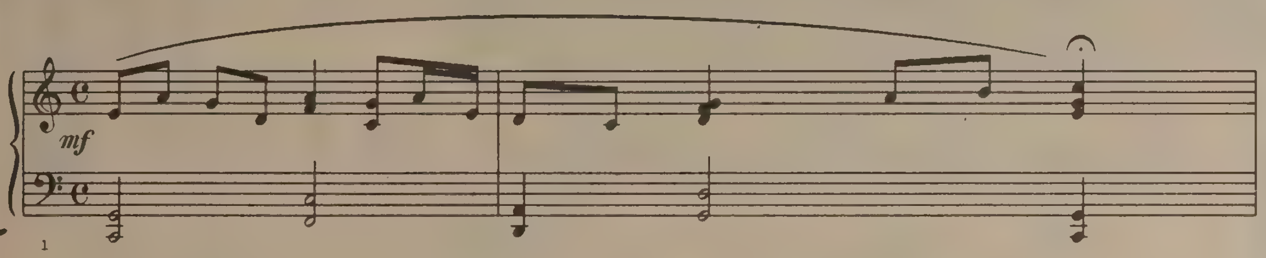

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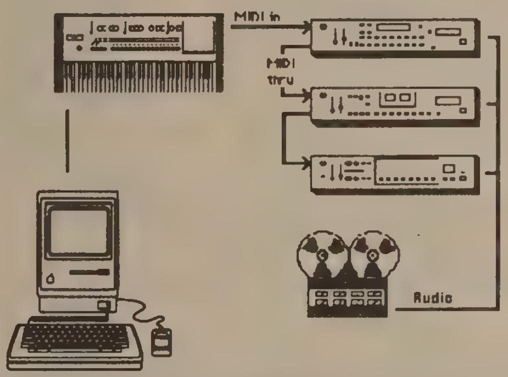

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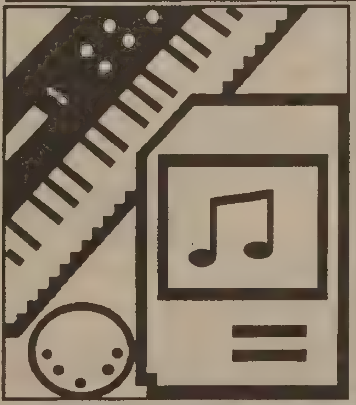

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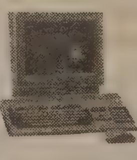

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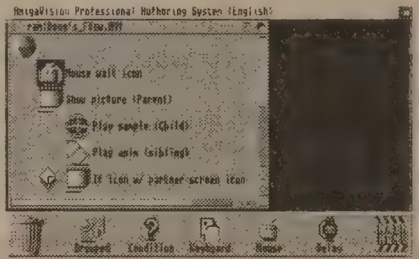
example, if a package doesn't support a particular music format, you can normally multitask a utility program to play the music. With respect to animation, other platforms generally offer quarter-screen or smaller graphics, but the option of full-screen playback makes the Amiga more versatile.

Many multimedia software products are available for the Amiga. Which one is best depends on the type of multimedia presentation you're trying to create. Here's a brief look at some of those products.

AMIGAVISION PROFESSIONAL

Commodore's AmigaVision Professional (AV Pro) represents one of the easiest and most powerful ways to link images, animations, sounds, text, laserdisc players, etc. into a single interactive (or non-interactive) presentation. AV Pro provides various built-in tools for integrating the images and sounds; through the use of ARexx, you can control peripherals not supported in native mode.

All the tools are implemented in the form of icons, which are placed in a "flow window" and collectively referred to as a "flow." This is very similar to a traditional programming flow chart, as icons are generally executed sequentially from top to bottom.



Although keyboard input is supported, nearly everything can be accomplished using the mouse. Icons are dragged from an icon toolbox onto a flow window and most icon parameters are also set using the mouse. Even numerical settings can be input using a graphical 10-key pad. Commands and special phrases can be inserted using scrolling lists. Icons already placed in a window can be copied or moved within the same flow or to a different window.

AV Pro's object editor provides an easy yet powerful way to set "hot spots," which cause something to happen when clicked on. Generally hot spots are mapped over an image that contains buttons or other obvious click-on areas. Selecting one of the spots returns a user-defined result which can be interpreted by a series of IF-THEN icons and branched off to other parts of the flow. Hot spots can also be animated, and even made to follow a path around the screen. Sound samples can be triggered if a hot spot is selected.

AV Pro offers a multitude of screen transitions, which provide an impressive way to change from one image to another. There are two types of transitions: bit-mapped and windowed. Bit-mapped transitions generally work at the pixel level, while window transitions utilize the entire image. However, differences in

RESOURCES:

AmigaVision Professional, $399
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CanDo, $199.95
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color palettes and resolutions will limit their availability or effectiveness.

AV Pro also features frame-accurate control of videodisc players and control of CD players. Excerpts from videodiscs and CDs can be seamlessly integrated into your production. The software supports various brands of disc players. Using ARexx, you can even utilize GVP's IV24 picture-in-picture abilities.

Besides merely triggering IFF samples, AV Pro can also play SMUS or MIDI files. These can be sent to a MIDI device, the Amiga internal sound channels, or both.

Since AV Pro was written in particular for creating CDTV software, there are many memory saving features like CDXL support and streamed animations and sound, which play from disk instead of entirely from RAM. Fonts can be loaded as needed. There is even a feature that allows you to set the memory configuration of your target machine, so you can tell if your flow will run properly on it. (Beware: this feature is not as accurate as you might like it to be.)

A stand-alone freely-distributable player program, missing in earlier versions, is also featured. Although AV Pro could be used for adding audio to Amiga animations, it is best suited for slide show-like presentations or interactive productions.

CANDO 2.0

CanDo 2.0 is more of a programming tool than a multimedia presentation maker like AV Pro, but it has all of the necessary tools to integrate graphics and audio, and far surpasses AV Pro's button-pushing interactive features. Its only major short coming with respect to multimedia is an absence of built-in screen transitions.

As any programmer will attest, one of the most difficult aspects of programming is creating an intuitive and consistent interface. CanDo, which is similar in some respects to the Dialog Editor included with Microsoft Excel, makes this extremely easy by letting you set up screens, input fields, menus, etc. using the mouse. Combine all of this with a rich programming script language and you've got an awesome programming tool.

With CanDo, your application, called a "deck," can have the look and feel of commercial quality software. Standard Amiga menus with keyboard shortcuts, appIcons, as well as hot spots (i.e., buttons) are supported. Besides handling input from the keyboard and mouse, CanDo also supports joysticks and the CDTV controller. A CanDo deck can be compiled into a stand-alone application or smaller versions, requiring a player or CanDo library, all distributable without license fees.

CanDo allows you to handle many chores that would otherwise require extensive coding and programming knowledge in a much simpler fashion. For example, one group of commands allows you to create, examine, and modify icons without knowing the file structure of an icon. You can even incorporate a

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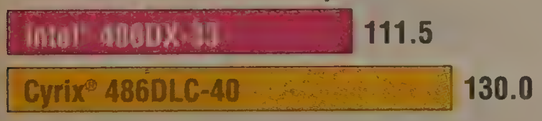
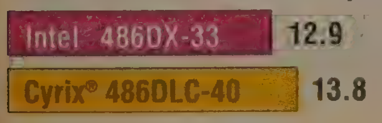


WinBench 3.1 Video Comparison



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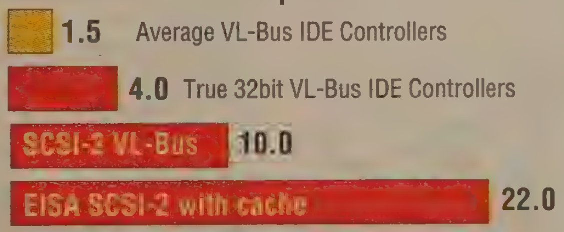

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simple paint program into your application. If you need database handling, CanDo handles this expertly. Powerful control over the parallel and serial ports is also featured; your application can even have its own ARexx port!

If your multimedia project requires extensive interactivity, CanDo may be the ticket. It is important to note, however, that although CanDo makes it fairly easy to set up an interface, making an application functional still requires a little bit of programming savvy in order to write the scripts.

Multimedia aside, if you've always wanted to write programs for the Amiga, but just couldn't learn C, CanDo is the answer to your prayers!

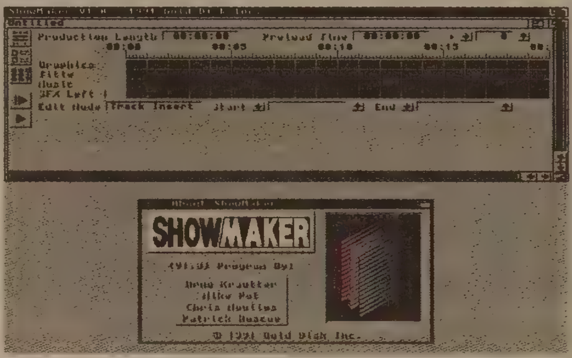
SHOWMAKER

Showmaker from Gold Disk lets you integrate and control graphics, animation, sound, and music files, and synchronize them with real-time titling and transition effects. Showmaker can also control external VCRs and videodiscs, and can automate Digital Creation's SuperGen 2000 wipes and NewTek's Video Toaster effects. It also supports ARexx.

I would consider Showmaker a multimedia sequencing program; you won't want to use it for an interactive presentation, since it lacks interactive features like hot spots.

Using a time-line approach, Showmaker provides a much more precise method for setting up a presentation than CanDo or AV Pro. Time moves in a linear fashion from left to right. Different types of events are listed from top to bottom. These events include graphics, titling, music, sound effects, MIDI commands, and volume controls. For example, if you want to show a picture for three seconds, you drag the mouse on the graphics line and highlight an area equal to three seconds. A requestor pops up where you designate the picture's filename.

Thirty-six different screen transitions are available; however, in contrast to AV Pro, transitions cannot occur directly from one graphic to another. Each graphic always fades to black first, before the transition is executed. This eliminates any possible problems caused by graphics with differing color palettes, but somewhat limits the effect.



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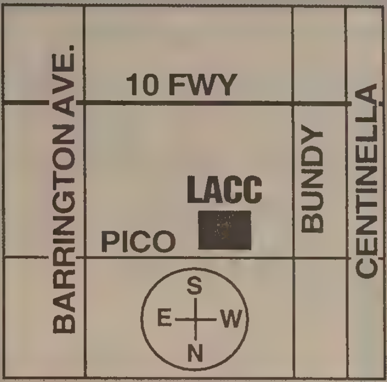

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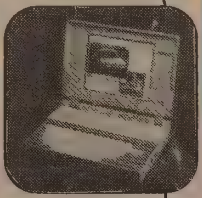

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You can set the desired frame rate for animations—if your Amiga can't handle this rate, the animation will just play slower. As a result, you'll have to tweak the animation or lengthen its time slot to make it work.

A very nice feature is Showmaker's built-in titling, which permits not only still text over still images, but moving titling over animations. One glaring problem occurs if the animation does not use the same color palette for every frame—the titling will change color as the frames change. Notwithstanding this malady, titling is done in real time and is quite impressive. You can use seventeen different motion patterns, which include titling that crawls across the screen as well as the standard scrolling-credits type. The text can be automatically set to outlined, shadowed, or extruded. There is no text import function; all of the text must be typed into the titling requestor. Only Amiga bitmapped fonts are supported, but there are plenty of good video-quality ones available.

Showmaker automatically calculates preloading requirements to help ensure that the production plays as smoothly as possible. It tries to load as much as it can into RAM to achieve this. Audio support includes the ability to play MIDI or Simple Musical Score (SMUS) files, as well as straight samples. The SMUS files utilize the Amiga internal sound channels, and samples can be directed to any of the four sound channels.

> Many multimedia software products are available for the Amiga. Which one is best depends on the type of multimedia presentation you're trying to create.

HYPERBOOK

Hyperbook, also from Gold Disk, is a quick and easy way to create interactive multimedia presentations. In some respects it is similar to CanDo, although its abilities are significantly more limited. However, Hyperbook is much easier to learn—almost simple!—and depending on your goals, it may be all you need.

With Hyperbook you build a presentation a page at a time. A page's resolution and number of colors are selectable; however, there's a maximum number of sixteen colors per page, even in low resolution. Pictures can be used as backdrops, with the 16-color limitation still imposed. Many page transitions are available.

Each page can contain one or more objects, which can appear as buttons, graphics, text, etc. Hyperbook features basic drawing tools for creating objects, or you can import IFF graphics. An object's background, border, and shadow can be set to a particular color or made transparent. Imported graphics will be remapped and sized to the page's resolution and colors.

As you might expect, objects can cause an action to take place when double-clicked. Actions include jumping to another page, showing pictures, displaying text, and making other hidden objects visible. The text display screen includes all of the necessary text navigation tools. Pictures displayed from an object action are not limited to sixteen colors; any ECS IFF graphic can be displayed. ARexx commands or macros, as well as DOS commands, can also be executed.

Animations and audio are not directly supported by the software; however, these are easily incorporated using ARexx or DOS calls. Of course, if the object is just a title or some other non-action aspect to the page, you can set it to a "no action" state. Irregularly shaped hot spots are supported using graphics. Only the areas in the graphic that are not color 0 are "hot," making the shape and not the background hot.

SUMMARY

Combining ease and features, AmigaVision Professional is a solid choice for interactive presentations. For the ultimate in power and versatility, CanDo is tops. If you need non-interactive precision, you might want to consider Showmaker. Hyperbook fits the bill if you are creating simple interactive applications.

Next month we'll take a look at a few more packages, including the recently released Helm from Eagle Tree Software. ■

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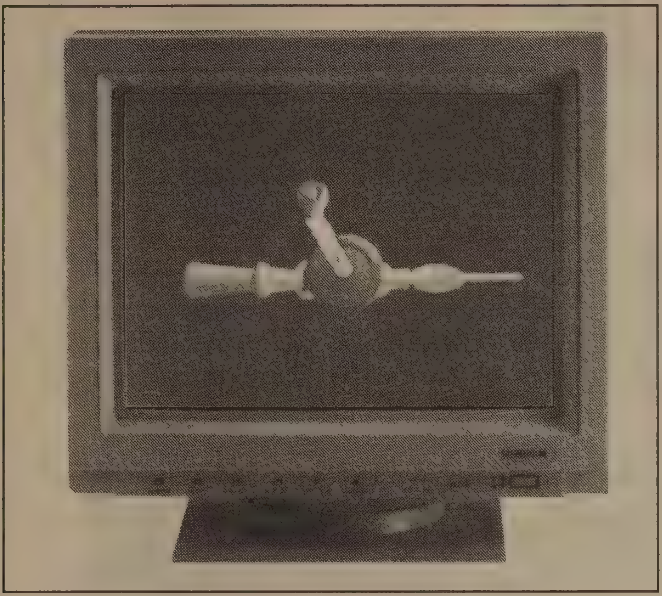

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- Resolution: Maximum 1600x1280 (Non-Interlaced) .28mm CRT
- Compatible With Apple Mac II
- Refresh Rate: 70Hz at 1280x1024
- VESA Standard

SRC-1451 14" HYPER VGA I

- Horizontal Frequency: 30-38KHz
- Resolution: Maximum 1024x768 (Interlaced) .28mm CRT
- Full Screen
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- Compatible With Apple Mac II
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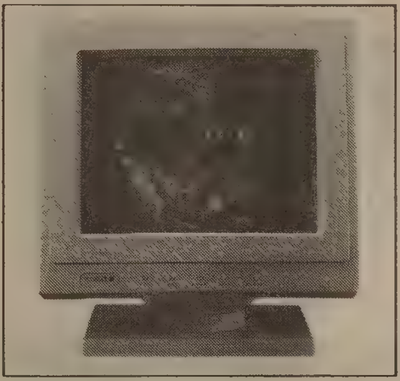
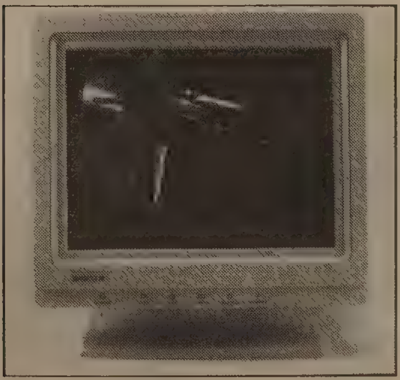


SRC-1452 14" HYPER VGA II

- Horizontal Frequency: 30-38KHz, 47-50KHz
- Resolution: Maximum 1024x768 (Non-Interlaced) .28mm CRT
- Full Screen
- Universal Power Supply 110/220
- Compatible With Apple Mac II

SRC-1403/SRC-1501 14", 15" HYPER VGA III

- Horizontal Frequency: 28-64KHz
- Resolution: Maximum 1280x1024 (Non-Interlaced) .28mm CRT
- Compatible With Apple Mac II
- Refresh Rate: 70Hz at 1024x768
- VESA Standard
- Automatic Pin Cushion Compensation



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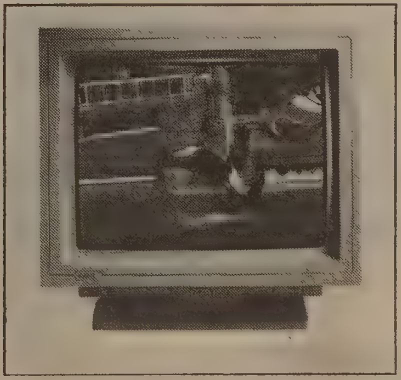

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Preview:

Digital World 93

CONFERENCE SCHEDULE
WEDNESDAY JUNE 23, 1993

Beverly Hilton Hotel
Beverly Hills
Conference: June 23-25, 1993
Saturday Seminar: June 26, 1993

If you're confused about multimedia or grappling with some of the problems the emerging technology poses, Seybold's Digital World conference is an invaluable resource. Bringing together professionals and analysts from the high-tech and entertainment industries, the sessions address issues ranging from emerging tools to intellectual property to the ever-popular "Who's paying for this anyway?"

For registration and other information, contact Seybold Seminars at 1-800-433-5200, fax (310) 457-8599.

9–10:30am
Opening Session I
John Sculley, CEO & Chairman, Apple Computer Inc.
Craig McCaw, CEO & Chairman, McCaw Cellular
Bob Carberry, President, Fireworks Partners, IBM Corp.
Moderator: *Jonathan Seybold*, Seybold Seminars

11am–12:30pm
Opening Session II
Richard Brown, Vice Chairman, Ameritech
Brian Roberts, President, COMCAST
Mitchell Kapor, Chairman of the Board, Electronic Frontier Foundation
Moderator: Jonathan Seybold, Seybold Seminars

2–3:30pm
Telecommunications Policy
Matt Miller, Vice President of Technology, General Instrument
Mitchell Kapor, Chairman of the Board, Electronic Frontier Foundation
Kenneth Thomson, Consultant
Michael E. Bloom, Director of Business Development, Kaleida Labs
Moderator: *Jonathan Seybold*, Seybold Seminars

4–5:30pm
PDAs: What Are They Good For?
Bill Warner, President, Wildfire Communications, Inc.
Rob Mechaley, Senior Vice President Technology Development, McCaw Cellular
Donna Dubinsky, President & CEO, Palm Computing
Barry Glick, President, GeoSystems
Moderator: *David Baron*, Seybold Seminars

(Dinner Break 5:30–7:30pm)

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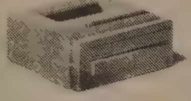

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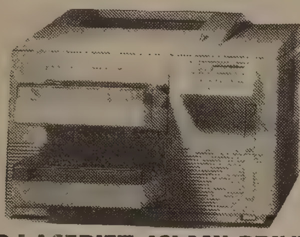

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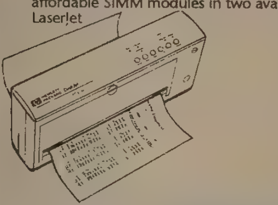

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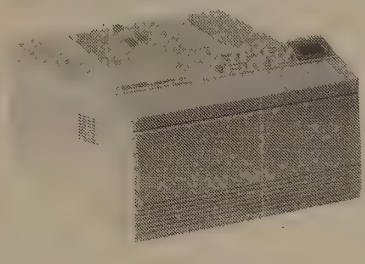

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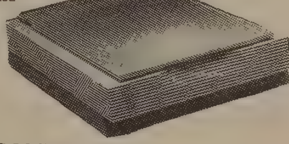

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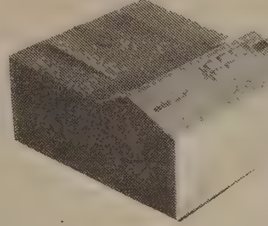

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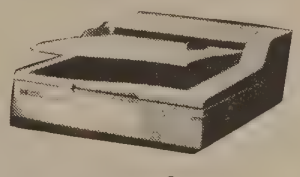

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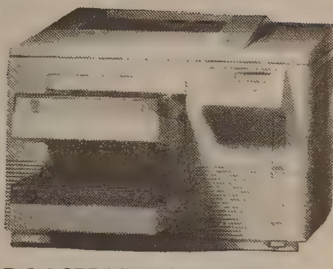

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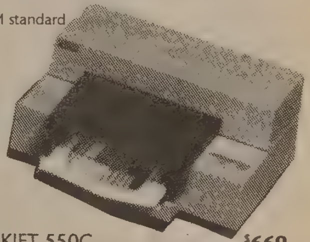

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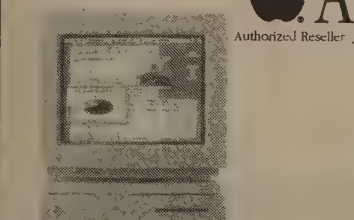

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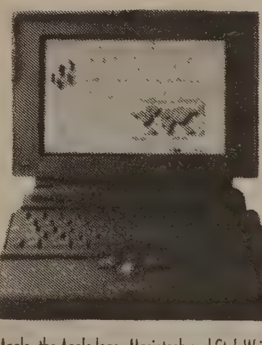

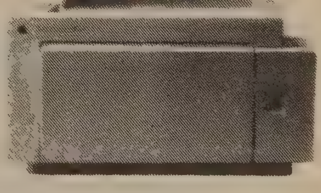

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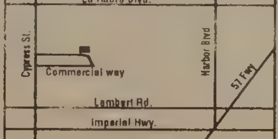

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7:30–9pm

Directors on Technology

James Cameron, Film Director & Co Chairman AFI Advanced Technology Council
Credits: *The Terminator I & II, The Abyss, Aliens II*
John Badham, Film Director
Credits: *Point of No Return, Bird on a Wire, Stakeout, Stakeout II, Short Circuits, War Games, Blue Thunder, Dracula, Saturday Night Fever*
Martha Coolidge, Film Director
Credits: *Lost in Yonkers, Ramblin Rose*, HBO's *Crazy About Love*, ABC's *Bare Essentials*, NBC's *Trenchcoat in Paradise, Real Genius, Joy of Sex, Valley Girl*
Moderator: *Jonathan Seybold*, Seybold Seminars

THURSDAY JUNE 24, 1993

8:30–10am

Projects and Prototypes

Edward D. Horowitz, Senior Vice President, Viacom International
Bruce Sidran, Executive Director, MCC/First Cities
Geoff Holmes, Senior Vice President of Technology, Time Warner Inc.
Moderator: *Denise Caruso*, Digital Media

10:30am–12 noon

Technology and Education

Dr. Dana Beth Ardi, President, Dana Ardi Prods.
Nancy Hechinger, Vice President, The Edison Project
Randy Jackson, Vice President of Publishing, TMM (Total MultiMedia)
Steve Carr, Model Technology Site Coordinator, Port Hueneme School District
Robert Tierney, The Ohio State University
Moderator: *Jonathan Seybold*, Seybold Seminars

2–3:30pm

Media Company Strategies

Michele DiLorenzo, Senior Vice President, Viacom New Media
Keith Schaefer, President, Paramount Technology Group
John Papanek, Editor-in-Chief, Time-Life, Inc.
Moderator: *David Baron*, Seybold Seminars

4–5:30pm

Security, Privacy, and Data Protection

Jim Bidzos, President, RSA Data Security
Joseph F. Swyt, President, Macrovision Corp.
Moderator: *Denise Caruso*, Digital Media

7:30–9pm

Neat New Stuff

Leo Hoarty, President, ICTV
John North, Vice President of Strategic Planning, ICTV
Nat Goldhaber, President & CEO, Kaleida Labs
David Kaiser, Vice President of Engineering, Kaleida Labs

FRIDAY JUNE 25, 1993

8:30–10:00am

The State of the Digital Society

Nat Goldhaber, President & CEO, Kaleida Labs
Craig J. Mundie, General Manager Advanced Consumer Technology, Microsoft
Trip Hawkins, President & CEO, The 3DO Company
Moderator: *Denise Caruso*, Digital Media

10:30am–12 noon

Leveraging the Deal: Content, Rights, and the Law

Jessee J. Allread, Vice President of Sales & Marketing, EBook Inc.
Richard D. Thompson, Managing Partner, Silverberg, Katz, Thompson & Braun
Moderator: *David Baron*, Seybold Seminars
Co-Moderator: *Joanna Tamer*, President, S.O.S. Inc.

2–3:30pm

Virtual Reality and Location-Based Entertainment

David Smith, President, Virtus Corporation
Diana Gagnon Hawkins, Consultant, Interactive Associates
Thomas Dolby, Musician/Artist
Bran Ferren, Senior Vice President of Creative Technology, Walt Disney Imagineering
Moderator: *Denise Caruso*, Digital Media

4–5:30pm

Closing Session

Richard Green, President & CEO, CableLabs
Nat Goldhaber, President & CEO, Kaleida Labs
Al Sikes, Vice President of New Media & Technology, Hearst Corporation
Moderator: Jonathan Seybold, Seybold Seminars

SATURDAY, JUNE 26, 1993

Innovation, Content, & Creation

Speakers include:
Allee Willis, Artist/Songwriter
David Riordan, Senior Producer/Creative Director, Philips POV
Ty Roberts, ION Inc.
Peter Black, President, Xiphias
Greg Roach, Artistic Director, Hyperbole Studios
Wendy Richmond, Director of Market Development, WGBH Educational Foundation
Steve Nelson, President, Brilliant Media
Stu Gannes, Books That Work
Glen Hoptman, Publisher & CEO, Lightbeam Communications

WEDNESDAY, JUNE 23,

2–3:30pm

Telecommunications Policy

EFF chairman Mitchell Kapor joins panel on data highways.

We are now setting out to build a new high-speed digital communications infrastructure. This will change the way information and entertainment is delivered and will open up a wealth of new products and services. The impact on our society will probably be more important than the building of the railroads in the 19th century.

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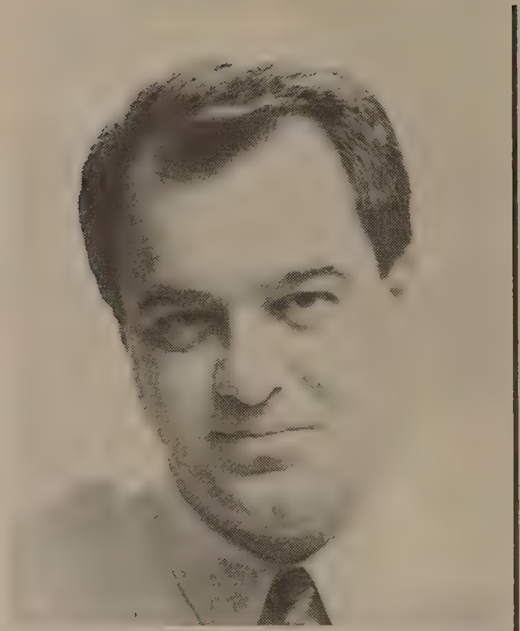
RSA Data Security's Jim Bidzos holds forth on security issues.

cable television, telephones, wireless services, and satellite individually rather than as part of a greater whole. We do not seem to know what we want or what our priorities should be.

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THURSDAY, JUNE 24

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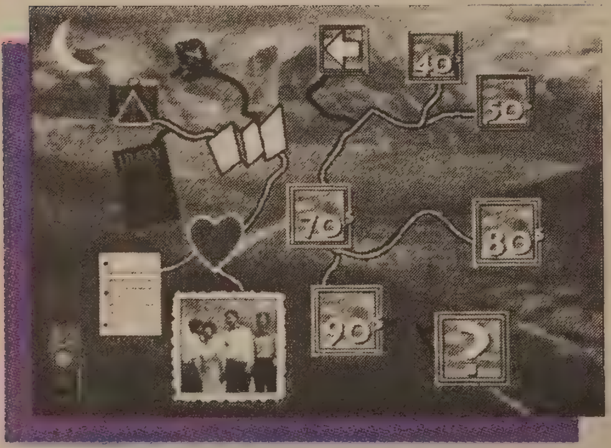
MULTIMEDIA 101

Digital Techniques In Performance Art

BY JONATHAN E.

Though multimedia itself seems to be in a perpetual state of lurking offstage, some artists are already using its techniques to entertain the audience. Using digital tools to manipulate and interact with images and sounds had been done experimentally in performance art even before the 1988 introduction of HyperCard and VideoWorks (now known as Director). Those two applications, however, stimulated a new and continuing wave of creativity in the performance art community.



Amid current rumors of half a dozen "multimedia nightclubs" in the works in San Francisco alone, it seems likely that multimedia will be experienced live and in public settings by most members of the public long before it appears in the home. Besides the other "hot-ticket" aspects of multimedia, the live-performance area has other advantages: performers and theatrical creators have backgrounds in telling a story, in aesthetic effects and pleasure, and in working through technical problems of combining media.

Here—as in every other area of multimedia—there is much discussion of approach and theory. Not surprisingly, the two major themes that have emerged are a short-term, economic one—"How are we ever going to get our hands on the equipment we need for this technology?"—and a longer-term, more open-ended one—"How do we address this technology, and what is it going to do to our art, our culture, and our society?"

There's an extended discussion of these issues, for instance, in the Cobra Lounge—Electronic Vaudeville topic in The WELL's Muchomedia conference. For a quick taste of the flavor, here's a quote from Mark Petrakis, impresario of the Cobra Lounge, on an interactive multimedia event recently staged in San Francisco. "[Interactive theatre] is going to have to be supportive of all kinds of group collaboration; both on the part of the 'world makers,' and on the part of those who will interact with those worlds. In such environments people will find themselves engaged, and so will challenge the system and each other to be present, to make something of the experience, to play the game, to be part of the show. ... It must first of all root itself in some kind of ritual behavior, because where there is ritual behavior, there too is 'show business,' and all technologies aside, show business is the serious fun business; where we turn, as a group, to share in the mysteries of

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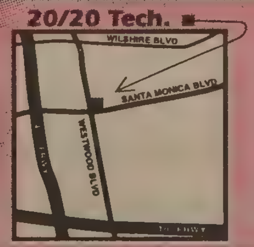

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transformation. That is the challenge that a 21st century 'interactive' theatre must meet. When it does, then it will take its place in the popular imagination right there alongside 19th century plays and operas, and 20th century movies and rock concerts."

NEXT EXIT

Dana Atchley has firmly grasped the essence of what interactive multimedia can do for the performance artist with his "Next Exit" show. Using MacroMedia's Director to control the sequence and pacing of each show enables him to "create a way to get onstage and have the freedom that a traditional songwriter or storyteller would have."

The show consists of Atchley telling stories of his life, much of which he's spent traveling around the US photographing roadside attractions and videotaping various bizarre and wonderful characters. He explains, "I've been a collector of images. I have every image I've taken since I was seven years old and got my first camera, every negative."

He laughs, "It's sick, it's compulsive. But I'm not the only one in my family that's been doing that. We have a complete family photographic history since 1863 to the present." Atchley has transferred these images to videodisc, shot a small amount of new footage and recorded voices of family members to flesh out some of his stories, added graphics to the video in appropriate places (such as when he crashed the car during his first driving lesson), and used Director to create the presentation that is the framework of his show.

Before performing, Atchley prepares by "packing his suitcase." Using Director, he drags the icon for each story he wants to tell that night into his virtual on-screen suitcase. Some stories are packed individually; some are stored in complete decades, the equivalent of a desktop folder. Each act of a show is represented by a suitcase, and each suitcase will unpack itself, arranging the story and decade icons in order on the highway icon representing the planned sequence of the show. This process is analagous to a musician's set list; it's a guide to what he'll do that night, but it can be changed spontaneously.

The screens from Director are projected onto the stage as the set, and there's a short prerecorded story about the alphabet game Atchley played on childhood family road trips. He enters carrying a suitcase and blows on a stack of logs with a TV set perched on top to create a video campfire. He addresses the audience as "the unseen eyes in the woods" and drops the real suitcase with a clunk, which cues the projected suitcase to unpack on screen.

Up to this point, he has had no immediate control over what's happening on screen except for cuing the unpacking of the suitcase. However, from now on he has complete improvisational direction over what appears, through manipulation of the story icons and a videodisc control panel (in Director) using a wireless mouse or trackball: "If I want to break out of the show, if I'm tired of it or don't feel the audience is buying it, I can just hit the road and go right on to the next piece. So I can go backwards, forwards, stop, and break out—these are great attributes as a performer."

Obviously not all of "Next Exit" was produced using desktop techniques. Most of the material predates the personal computer, and a lot of the graphics were created using the high-end Varitel Video Paintbox. However, the show owes much of its current manifestation to desktop multimedia.

Regardless of the technical details, the most important element of "Next Exit" is its emotional content, which proves most convincingly that multimedia will be a vehicle for personal expression. In addition to its live performance abilities, "Next Exit" has substantial promise as both a gallery installation and as a boxed consumer item.

Dana Atchley will present "Next Exit" live at the American Film Institute, 2021 Northwestern Avenue, Los Angeles, CA 90027, on July 9. Call 1-800-999-4AFI for further info. Look for him to appear at Life on the Water in the Bay Area later this year.

NEW MUSIC THEATRE, ZAKROS INTERARTS

Randall Packer and Belén García-Alvarado of New Music Theatre work on a less personal scale, producing both large theatrical pieces and trade-show presentations. Their last piece was a site-specific and satirical presentation at the Apple Expo.

They created a fictitious product called the Artomatic to parody the quality of clip art and sounds bundled with applications. They also spoofed the marketing claims that multimedia products "allow people to make instant automatic art" by putting "together the worst possible presentation you could imagine." They quickly added that the latter part of the piece showed that "you can make really interesting art with Director," which was the application used for the presentation.

Video effects were generated live by the VideoMachine from Fast Electronic, and Pamela Z directly manipulated the sound through the BodySynth, which Randall describes as "the most exciting thing I've seen, because it provides a direct link between a human figure and the theatrical environment." (For information on the BodySynth, contact Ed Severinghaus at 415/387-1142.)

Packer and Garcia-Alvarado also run Zakros InterArts in San Francisco, which offers workshops and demonstrations for various useful multimedia techniques on most Monday evenings. On June 14, Packer will show how Director can integrate graphics and animation, with MIDI and other music technologies. On June 21, Mark Segal of Silicon Graphics will preview the multimedia capabilities—including video, animation, and virtual reality—of SGI's new Indigo computer. On June 28, visual artist Charles Rose will demonstrate the uses of Kodak's PhotoCD technology for digitizing high-quality im-

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agery for multimedia authoring, theatre design, and 3-D animation. The workshops cost a very reasonable $20 for a small-group situation, start at 7 pm, and are held at 614 York St., San Francisco, CA 94110. Call (415)282-5497 for further information.

ONLINE DESIGN

The OnLine Design Multimedia Project of May 14–15 demonstrated the pitfalls awaiting those who dive into multimedia without sufficient resources. The original idea was a relatively simple display of Ampersand Design's computer equipment, basically geared towards high-end graphic design and prepress work.

When the QuickTime capabilities became available, Howard Vicini piggybacked the concept of using the occasion to show what could be done with the technology in a period of three months by a relatively inexperienced group of artists. It was a brilliant and worthy idea; its results show that creating viable multimedia, especially live, is not easy.

The project was plagued by the sort of difficulties that are hard to foresee—new tape machines burning out while recording video, bad cable connections, etc. These problems can be solved with duplicate equipment and more generous scheduling, but those luxuries aren't always available. Another problem was shortage of RAM. One Quadra 700 was running with only four megs. As artist Sue Sellars said, "It's like running a Mercedes with a *Deux Cheveaux* motor." To make things worse, it was being used to demonstrate Painter, v2, which requires eight megs. The predictable happened—it crashed. This was really a pity; not only was Sellars' art very impressive for its content and technique, but she also had some personal interaction going on with those around her who were beginning to use the machine as well.

What was shown were videotapes of QuickTime movies, many without sound. Clearly it is possible for neophytes to produce pretty visual effects and edit video footage using QuickTime. However, the interactive possibilities of multimedia were not demonstrated.

By far the most serious problems came about due to the presentation of the event and the content of most of the work. These are exactly the sort of things that experienced and trained performance artists are used to dealing with, and more experience in these areas could have dramatically improved the outcome.

This was an extremely ambitious undertaking, and those involved should be applauded for having the guts to attempt such a thing in public. As an experiment designed to show what it takes to make multimedia, its result is unequivocal: it takes more than meets the eye. ■

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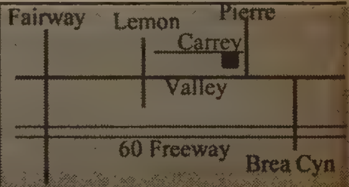

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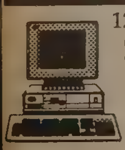

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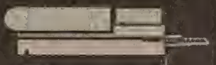

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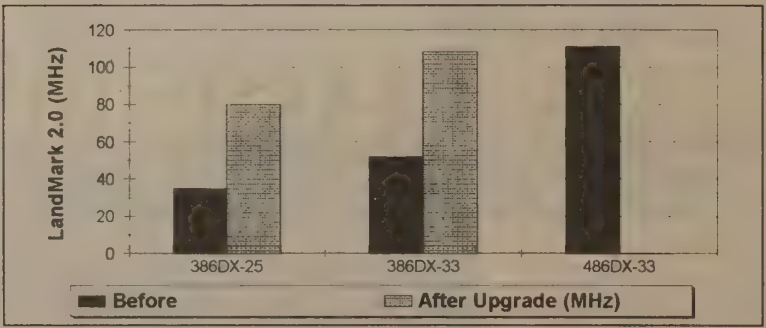

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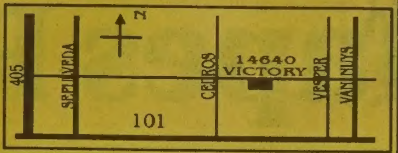

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Secret Tapes Revealed For First Time

Or

The Hiring Of A Public Relations Expert

BY JOHN C. DVORAK

Through negotiations with a former KGB operative working under deep cover in the Silicon Valley area, MicroTimes *was able to purchase a set of tapes that revealed the secret procedure for hiring public relations people to work in the high technology field. The excerpt below is part of a longer interview and was only edited for the purposes of fitting it into this column.*

The participants' names will not be revealed; we'll use the generic name Jack as the company owner and Jane as the interviewee (who eventually got this job).

DVORAK'S LAST COLUMN

Copyright© 1993 by John C. Dvorak. All rights reserved. *John C. Dvorak graduated from the University of California. He is a contributing editor of* PC Magazine *and* MacUser, *and is considered by many to epitomize the contrarian view of things—a charge he vehemently denies. Dvorak's motto is: If you have nothing nice to say, then don't say anything at all.*

Jack: Welcome, have a seat.
Jane: A seat? What do you mean?
Jack: Be seated. Sit down. Right there in the chair.
Jane: Oh! I'm sorry, I thought you meant something else. I've been dieting.
Jack: Don't worry. For some reason none of the women we hire, and we hire only women I might mention, understand "have a seat."
Jane: That's good to know. So I'm doing OK?
Jack: Excellent.
Jane: Why do you hire only women?
Jack: Because in high technology the players are 95% men and few of them get out much. They need to see a good-looking babe once in a while.
Jane: Should I take offense at that? Good-looking babe?
Jack: It's a fact. Besides that, you're a good-looking babe.
Jane: Why *thank* you! Do I have to date you?
Jack: No, I don't believe in fraternization. But would you if I asked?
Jane: I have a boyfriend. But if I didn't I might! Do I have to date the guys I talk to? Who are these guys? You said the business was 95% men. Is it some gay thing?
Jack: It's computers, and dating the guys is up to you. I'd talk to the other girls first. None of them date any of the guys in the business. Too geeky. Too dorky. A lot of the guys in the business are rich and you might want to line one up, but forget about the media guys. They're all broke and they're just as geeky.
Jane: I think I'll skip the idea of dating...unless, of course, the guy is really rich.
Jack: Good thinking. How much do you know about PR?
Jane: Nothing.
Jack: Perfect. The job is mostly calling journalists and asking them if they received a press release. They hate that!
Jane: They hate it? Then why do we do it?
Jack: To promote the PR firm. Try and remember that we promote ourselves first and the client second.
Jane: What's a client?

Jack: The job is mostly calling journalists and asking them if they received a press release. They hate that!

Jane: They hate it? Then why do we do it?

Jack: To promote the PR firm. Try and remember that we promote ourselves first and the client second.

Jack: The client pays us to promote his or her product. We pass out press releases, talk to writers, and stuff like that.
Jane: Cool. Do I get to write a press release?
Jack: It depends. Did you get a college degree? Can you write?
Jane: I went to JC and got my AA in marketing.
Jack: Really? That can come in handy. Can you write?
Jane: No, not really.
Jack: Good. Neither can I. Do you know how to hand something to someone?
Jane: Yes, I'm really really good at that.
Jack: Great, because you'll have to hand out a lot of things. It's a lot of fun, especially at trade shows.
Jane: Wow, this sounds like a great job.
Jack: It's a terrific job, are you kidding? You get to fly places in an airplane and hand out stuff and call people up and bug them. I love it.
Jane: It sounds great. Do I get the job?
Jack: If you want the job, it's yours.
Jane: Wow! Really!?!? When do I start?
Jack: You start right away. Here's a list of writers. Introduce yourself to them, tell them the company name—our company, that is—then ask them if they received our press release for Dumbo Computers.
Jane: OK, great. Do you have the list?
Jack: Here you go.
Jane: Hmmmm. What's this name...De-bor-ak? John C. De-bor-ak from *MicroTimes.* How do you pronounce that? Is it De-bor-ak?
Jack: Exactly! You're perfect for this job! ■

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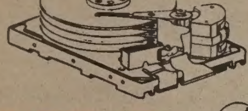

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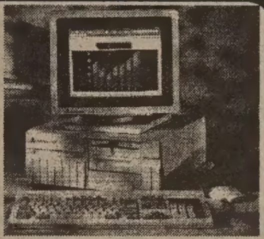

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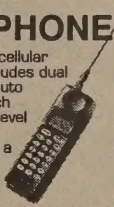

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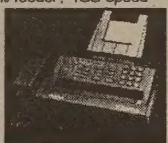

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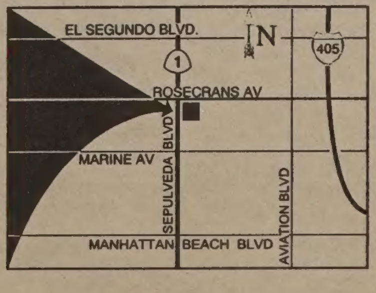


Even a *free* memory manager may not be a bargain—especially if it can't give you all the memory you need.

Introducing QEMM 7 The Memory Manager Worth Paying For

The newest version of QEMM, version 7, pioneers new ways of using the critical area between 640K and 1024K. It optimizes this area, taking into account the many drivers that need more memory at start-up than when running; instantly calculating millions of possible memory configurations to find still more memory for your applications, TSRs and utilities to use.

Instant Riches

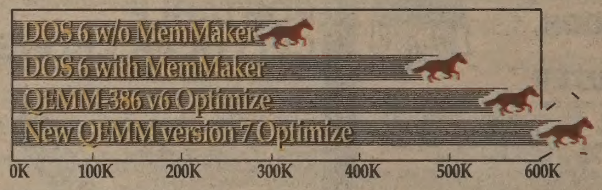
What does more memory mean in a practical sense? It means that your DOS and MS Windows programs run faster, smoother and more reliably. It means you can continue to add valuable utilities, drivers, TSRs and new capabilities to your PC. Whether it's workhorse drivers like LAN utilities and fax drivers; productivity-enhancers like disk caches and disk compressors; or fun and exciting capabilities like sound boards, CD ROM drivers, graphics tablets, etc. The better your memory is managed, the more versatility and flexibility your PC will have. QEMM 7 lets you have it all without fear of 'out of memory' messages or crashes.

DOS 6 Giveth; DOS 6 Taketh Away

The best feature of new DOS 6 is the stable of utilities it includes. Trouble is, they all eat up memory. DoubleSpace file compression needs 43K, Vsafe anti-virus needs 7-45K, Smartdrv disk cache needs 28K and even Undelete takes 10-14K as a resident program. Using MemMaker, you could easily lose—not gain— available 'conventional' memory in DOS 6.

New QEMM 7 takes the best of the new DOS 6 features into account, finding ways to cut memory demands for these utilities by up to 80%, ensuring that the all-important memory below 640K is free for your programs. And QEMM 7's seemingly small feature of supporting DOS 6's multiple configurations gives you the flexibility and ease of setup that you expect. (MemMaker doesn't work well with this important DOS 6 feature.)

How to Look a Gift Horse in the Mouth

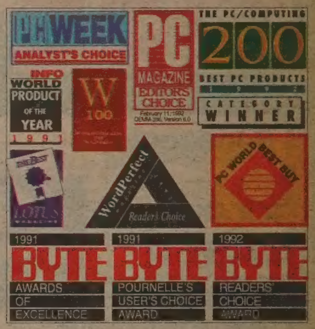


We tested DOS 6 with and without MemMaker and QEMM6 and our new QEMM 7 runs away from all of them. See details of test conditions listed below.

Page Frame: the Key to Your Future

There's been a lot of jealous talk about our patent-pending Stealth technology. Nobody else can duplicate its 48-115K gains.

The key to Stealth is its use of a 64K reserved area above 640K called the page frame. Besides being used by Stealth, the page frame lets Lotus 1-2-3 r2.x run larger spreadsheets and WordPerfect 5.x larger documents. It's also used by DESQview for multitasking, Novell Netware, IBM LAN Server and DECnet for reducing the network driver memory footprint, plus games for fast action. You sacrifice all this when other memory managers turn off the page frame. Stealth saves you room to set up your PC with a mouse, CD ROM, sound board, a network such as Novell NetWare, create 8-24K of extra memory for optimal MS Windows performance, use all of DOS 6's memory-hungry utilities and still have more than 630K to run applications smoothly and safely.



Prior versions of QEMM won just about every competition in sight, as well as remaining the #1 best-selling memory manager 5 years straight.

Put Your Money on a Winner QEMM 7

The new and ever more exciting capabilities coming to your PC will all compete for memory with your favorite applications, TSRs and drivers. And that makes QEMM 7 the most vital utility you can own.

Our seventh-generation memory manager is a thoroughbred that helps you get the most out of your PC today and tomorrow.

Quarterdeck

How we got the chart numbers CPU—486/33 ALR Power/business VEISA machine equipped with 16 megs of RAM and running MS-DOS 6. Comparisons were done using the following memory managers: QEMM 7, QEMM 6.02, MS-DOS 6 MemMaker. In addition to the driver (or drivers) required by each memory manager, the following drivers, DOS resources and programs were loaded for all comparisons: in the CONFIG.SYS file: SETVER.EXE, DOS=HIGH, FILES=20, BUFFERS=10, STACKS=0.0, MVSOUND.SYS, SNDBK12.SYS, SLCD.SYS, DOS SHELL=statement, in the AUTOEXEC.BAT file: VSAFE, MSCDEX, UNDELETE, LSL.COM, NE2000.COM, IPXODI.COM, NETX OR EMSNETX, MOUSE.COM, SMARTDRV.COM, PRTSCCAP.COM. ©1993 Quarterdeck Office Systems. Trademarks are property of their respective owners.

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